MANUALS FOR THE MANY

No. III.

# BEE-KEEPING.

BY THE LATE J. H. PAYNE Esq.

THIRTIETH  THOUSAND



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# BEE-KEEPING FOR THE MANY;

OR,

THE MANAGEMENT OF THE

## COMMON AND LIGURIAN HONEY BEE,

INCLUDING

THE SELECTION OF HIVES

AND

A BEE-KEEPER'S CALENDAR.

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By J. H. PAYNE, Esq.

A NEW EDITION REVISED AND ENLARGED BY THE EDITORS OF THE JOURNAL OF HORTICULTURE.

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# BEE-KEEPING FOR THE MANY.

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## NATURAL HISTORY.

The following brief but comprehensive epitome of the principal facts in the natural history of the Honey Bee is from the pen of Mr. Woodbury, of Exeter, better known to the readers of The Journal of Horticulture as "A Devonshire Bee-keeper."

"The Queen.—There is in every prosperous colony of Bees a queen, or mother Bee, whose peculiar office is to lay the eggs from which the future Bees proceed. Her fecundity is amazing, it being computed that she is capable of laying from 1500 to 2000 eggs a-day.* She receives the greatest attention and respect from the other Bees; none of them appear willing to turn their backs upon her, but all are watchful to offer food and anticipate her every want. The cells in which queens are reared differ very considerably from those of the workers or drones, being much larger, and hanging in nearly a perpendicular position, generally from the edges of the combs. Queen Bees occupy about sixteen days from the laying of the egg to the evolution of the perfect insect, and take wing when a few days old, in order to pair with a male Bee or drone. When once fecundated, a queen Bee continues fertile during the remainder of her life. According to Huber, fecundation is imperfect when delayed beyond twenty days, and drone eggs only are laid ever afterwards; but the observations and experiments of Dzierzon and Berlepsch, which have been confirmed by Von Siebold, the distinguished German naturalist, prove that this phenomenon is rather to be ascribed to parthenogenesis, and that a drone-breeding queen is in reality a virgin queen. I have myself succeeded in repeating and verifying the microscopical investigations of Von Siebold, which establish this remarkable fact beyond the

* Queen Bees of the Ligurian species are stated to lay as many as 2000 to 3000 eggs per diem.

possibility of a doubt. Queen Bees are readily distinguished by their larger size, being fully one-third longer than the common Bees, and are armed with a sting, which, however, they rarely use, except in combat with one another.

"The Workers are imperfect females. There is no doubt that every worker egg or grub not more than a few days old is capable, by appropriate treatment, of becoming developed into a perfect female or mother Bee. If the queen is removed from a hive the Bees avail themselves of this power by enlarging certain worker cells, and raising therefrom queens which differ in no respect from those bred in the usual manner.* When this interruption of the ordinary course of things has taken place, it is occasionally found that the ovaries of some of the workers have become sufficiently developed to admit of their depositing drone eggs, although Von Siebold declares them to be perfectly incapable of pairing with the male. The workers constitute the great majority in every healthy colony, and upon them devolves the labour of collecting honey for the subsistence of all, pollen for feeding the young, and propolis for stopping any crevice which might harbour an enemy. They are also occupied in secreting wax,† building combs, feeding the young and the queen, as well as guarding and ventilating the hive. Huber noticed two kinds of working Bees, which he denominated respectively nurses and wax-workers. This division of the workers into two classes has evoked ridicule from some, and has been regarded with incredulity by many. My own observations prove, however, that there really is a division of labour among Bees, and that whilst the younger portion of the community devote themselves to the home duties of the hive, their elders are employed in ranging the woods and fields to provide sustenance for the entire family. Workers arrive at maturity in about twenty-one days from the laying of the egg.

"The Drones are males which take no part in the duties of the hive, and whose use appears to be that of fecundation. They are allowed to exist only during summer, when they are very numerous, apparently out of all proportion to the perfect females. But this apparent disproportion is only a means to secure the important end, that when a queen takes her wedding flights she may have a good chance of attaining her object. Although the drones are much larger and stronger than the workers, they have no stings wherewith to defend themselves, and are thrust out of the hive to perish when their office is accomplished. They ma-

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* Advantage is taken of this remarkable fact in the formation of artificial swarms, &c.

† Wax is a secretion from the body of the Bee, and not a material conveyed into the hive. In order to form wax Bees must have access either to honey or some other saccharine substance.

ture in about twenty-four days after the egg is laid and are bred in larger cells than the workers."

## SITUATION OF THE APIARY.

Aspect.—I will commence by giving the aspect best suited for the Bees to be placed in. I have tried all aspects, and have no hesitation in saying that the south is the best. Bee-houses of all kinds I very much dislike; many hives are ruined by them; they are expensive in the first place, and they form a shelter for their worst enemies, mice, moths, spiders, &c., and not the least, *dampness*, which is ruinous to them. I would recommend the hives being placed south, or as nearly so as may be convenient; if at all varying from it, give them a little inclination to the east, and be sure to place them so that they have the morning sun, for the honey-gathering for the day usually finishes by two o'clock; therefore an hour in the morning is of much importance to the Bees, as well as to their proprietors. Another inconvenience arising from Bee-houses is that several hives being placed upon the same board encourages pilfering, and renders it almost impossible to operate upon one hive without disturbing the whole.

Stand for Hive.—Having, therefore, for these reasons, recommended the abandonment of Bee-houses altogether, I would say, Place each hive upon a separate board supported by a single pedestal 4 or 5 inches in diameter—a piece of wood with the bark on does remarkably well; place it firmly in the ground, and about 15 inches from its surface. Upon the top of this post should be nailed firmly a piece of board 8 or 9 inches square, upon which should be placed the board the hive stands upon, but not united to it, so that the hive may be removed whenever required without disturbing the Bees.

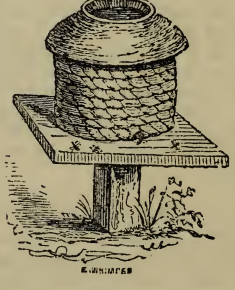


Fig. 1.

Clay or mortar should never be used to fasten the hive to the board; the Bees will do that in a much more effectual manner themselves, with a substance they collect from resinous trees called propolis. Mortar or clay tends very much to decay the hives; and hives managed on this principle are expected to stand for fifteen or even twenty years.

Let the hives be placed about 3 feet apart from each other, and in a right line. The best covering, as a protection from rain, is a large flat earthen pan (a milk-pan) sufficiently large to prevent the drip from falling upon the board. It would in all cases be well to give them the shelter of a wall or fence from the north, but on no account place them close to it, but leave a space of 4 or 5 feet at least for a path; for the operations of taking off small hives, glasses, or boxes of honey, are much more conveniently effected at the back than in the front of the hives. It would be well to clean the boards on which the hives stand four times in the year—namely, in January, March, April, and November. January and March are the most important.

The place where the hives are fixed should be kept clear of weeds; and plants which rise in height equal to or exceeding the entrance of the hives should not be suffered to grow near them.

## HIVES.

I am more and more convinced, from experience, that Bees do much better in broad, shallow hives, than in any others. All the hives that I have used myself for the last three years, and those that I have had made for the last two, have been of this kind—namely, 7 inches deep, and 14 inches wide, measuring in the inside. The only inconvenience that can possibly arise from a hive of this shape is, that from the great weight of supers which year after year it will have to bear, the top will sink a little; therefore it should never be used without an adapting-board of 12 inches square; this will take the weight of the supers from the centre to the side of the hive; indeed, it would be better to let the adapting-board remain a fixture upon the hive when once fastened down by the Bees, and should the corners at all interfere with the cover, where the milk-pan is used, they may be rounded off a little to the size of the hive.

### PAYNE'S IMPROVED COTTAGE HIVE.

With regard to the materials of which hives are made, I believe it to be a matter of indifference whether straw or wood be used, but the facility and economy in the construction of straw hives must always be a recommendation, especially to the cottager. Having, therefore, decided upon the materials for cottagers' hives, their form must now be considered. For straw hives I would recommend the following size:—7 inches deep and 14 in diameter; straight at the sides and flat at the top; in shape like a half-bushel measure. A hole should be made in the top 4 inches in diameter, and a piece of straw-work, like

that of which the hive is made, large enough to cover it, must be fastened over the hole; not to fit in, but to cover *over* it.

It is better to have a groove made in the floor-board for an entrance than to cut a piece out of the hive. The entrance should be 3 inches wide by three-eighths of an inch high, to which affix a piece of copper or zinc, about 6 inches long by 3 inches wide, having a groove to admit two sliding plates, one perforated, and the other having a hole large enough to allow but one Bee to come out at a time.

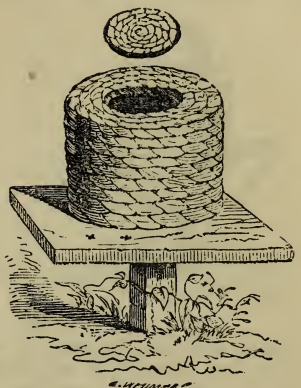


Fig. 2.

Great advantages arise from this little apparatus; the perforated slider is used to confine the Bees to their hive when snow lies upon the ground, which entices them out, and they perish; it is useful, also, when feeding becomes necessary, to exclude all intruders. The other slider

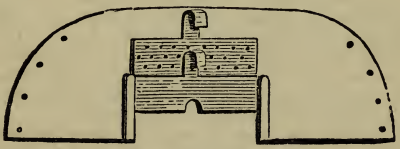


Fig. 3

is used both in spring and autumn, preventing either robbers or wasps from entering; for three or four Bees, with the help of this slider, can guard the entrance more effectually than ten times that number without it.

Supply of Hives.—To those persons who are disposed to adopt the very simple method of managing their Bees that I have for so many years successfully followed, I would say, Procure a supply of *Payne's Improved Cottage Hives;* also of small hives, 8 inches in diameter and 7 inches deep, flat at the top with a bit of glass in one side covered by a shutter. This hive

is in shape the same as the large one, and with a hole in the top covered with a piece of straw-work in the same manner.

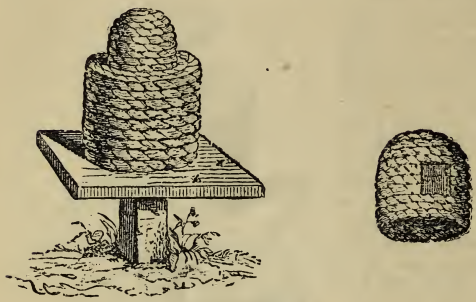


Fig. 4.

Boxes and Bell-Glasses.—Should boxes be preferred, those which I use are made of inch-thick deal, 9 inches square, and 8 inches deep—inside measure; with a piece of glass 6 inches by 7½, let in on one side, and covered by a shutter to exclude the light. Bell-glasses may also be used with equal success if the light be effectually excluded. I usually put on a bell-glass first, and when partially filled, raise it up and place between it and the parent hive the small hive or box above described. I say *partially* filled, because, if allowed to remain till filled, the Bees would very probably swarm, which the additional room and ventilation given them, by placing either the box or small hive between the glass and parent hive, will prevent.

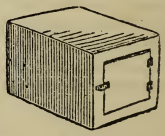


Fig. 5.

Adapting-Board.—A good supply of adapting-boards must also be in readiness. They should be made of mahogany, for it will allow of being worked very thin, without the risk of warping when used. They are a quarter of an inch in thickness (*this is important*), 12 inches square, with a circular hole in the middle 4 inches in diameter.

Fig. 6.

## NEIGHBOUR'S IMPROVED COTTAGE HIVE.

I would say that it consists of a straw, circular, lower compartment, having three windows and outside shutters; a thermometer is fixed across the centre window, so that the Bees

cannot work between it and the glass, and thus intercept the view of the graduated scale. This little thermometer is found to be a useful appendage, as it affords to the apiarian a correct indication of the state of the hive at all seasons of the year. This lower or stock hive rests on a stout wooden floor, at least 2 inches in thickness, projecting in front as a landing-place for the Bees, which enter under the hoop attached to the straw, by means of a sunken way; the *hoop* is used to overcome the uneven surface of the straw, as well as to give durability to the hive. The top is also of wood, having three or more circular openings, of about 3 inches diameter, to receive as many glasses.

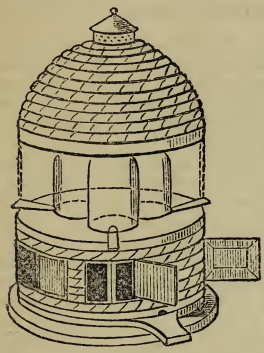


Fig. 7.

In the top of each glass is a small hole, through which a tube of perforated zinc is suspended, upon which guide-combs may be fixed; it also forms a convenient support, to which the Bees attach their combs. Over the glasses is placed a cover of straw (also *hoop*-bound), closely fitting the top of the stock hive, and secured by means of thumb-screws, so that it can be removed with great facility, to allow of inspection or operations. This straw cover is surmounted by a ventilator, forming a neat finish, and by which the temperature of the glasses may be regulated.

## NEIGHBOUR'S OBSERVATORY HIVE

Is of very stout glass, with an opening at the top of about 2 inches diameter, over which a small glass may be placed when necessary. The large, or stock hive, stands on a mahogany floor-board, with a circular sinking to receive it; there are holes in the floor-board, covered with perforated zinc, for the purpose of ventilation. Within the hive, on an upright support rising from the floor-board, are arranged, in parallel lines at right angles, eight bars of about an inch wide, leaving a space next the glass all round, to which the bees in the first instance attach their combs, guide combs having been placed upon them. There is a cover made of straw for the whole, which reaches the floor-board, and can be raised at pleasure; a landing-place, projecting as usual, with a sunken way to allow the Bees egress and ingress, which completes the contrivance.

## TAYLOR'S AMATEURS' HIVE.

Having thus far given my plan for managing Bees in the *Improved Cottage Hive*, I would now address a few words to the amateur, for the purpose of recommending to his attention one of the best amateur's hives that I have ever seen. It was invented by Mr. Taylor, author of "The Bee-keeper's Manual," and is called "Taylor's Amateurs' Bar Hive."

By the introduction of *bars* each comb is made available, whether for separate extraction or for experimental purposes. Indeed, in this hive both the Bees and their store are at all times completely under the command of their proprietors. From this hive fine honey may be obtained, swarming effectually prevented, and artificial swarms, when required, insured. I was kindly favoured with one of the above hives from the inventor in time to have a swarm hived into it on the 28th of May. In about three weeks from that time, I found it necessary to put on the upper box; and early in September I took it off, containing 30 lbs. of the finest honeycomb, yet leaving a full supply in the lower or stock-box for the Bees during the winter and spring. Another great advantage from this hive, above all others, is, that *a comb may be extracted at any time*, which, where glasses or boxes are used, cannot be done; these must be filled before they are removed, or much loss of time is occasioned to the Bees.

Having already described the hive I most approve of, I will now give a description of a newly-invented one of my own. Convinced, as I have for some time been, of the many advantages arising from having every hive fitted with bars, I have at length constructed *a square straw hive* of that kind, which, from its inexpensiveness, I trusted would have come within the reach of almost every cottager; but since putting together the little items of cost for its several parts I fear that I am mistaken, for it can cost but little, if any, less than 8*s*. The hive, as I have already said, is of *straw*, and perfectly *square*, 13½ inches by 13½, fitted with eight bars of 1⅛ inch wide, with a cover of wood—the bars are kept in their places by zinc fittings. The openings in the crown-board are so placed as to allow of one large glass, or two or three small ones, being worked. It is protected from the weather by a milk-pan only in the winter, and in the summer, whilst glasses are on (which may be covered with an old hive), by a milk-pan and zinc shade. From the facility given by the bars to renew the combs, this hive may be expected to stand for many years: therefore, two or three coats of paint should be given it before the Bees are put into it, and an additional one every year or two afterwards; and, as a further means of preserving it from decay, the floor-board should be the exact size of the hive, so that the drip from the milk-pan clears it. A slight projecture in front

for alighting must of course be allowed; but by a careful adjustment of the milk-pan the drip may be made to escape this also.

## FENN'S HIVE.

There is an admirable hive contrived by Mr. Robert Fenn, of Woodstock, described in the *Journal of Horticulture*, and which has proved one of the best of what may be called "cottage hives." It consists of a straw hive, *fig.* 13, 3, 16 inches in diameter, 11 inches deep, straight-sided, quite flat on the top, the permanent mahogany adapting board having a central hole about 3 inches in diameter, over which is placed a thinnish round of plaited straw, slightly secured with wall nails, though sufficiently so to prevent the egress of the Bees. Two pieces of hard-wood sticks run completely and centrally through at right angles to support the comb. The central hole of the adapter, *fig.* 9, is fitted with a moveable round piece of thin deal that fits exactly to the size of the hole, and this is supported by four pins that are let into the sides of the hole, and project about one-eighth of an inch, so as to allow the flap to rest upon them. The edges of the rounded flap are cut away as represented in *fig.* 9, so as to leave openings between the flap and the adapter of not more than one-quarter of an inch, which will admit the worker Bees to ascend upwards, but not the queen or the drones. Two other openings may be cut not quite one-quarter of an inch broad, and three-quarters of an inch from the sides. Two rows of holes may be bored, or a slit too narrow to allow a Bee to pass, may be formed along the centre of the flap to act as an air-passage. A strip of paper pasted to the flap and the adapter will form a sort of house. Paste another piece of adhesive on at the opposite end of the flap only. When the permanent adapting board is placed—for it is never removed during the honey-gathering season—upon the hive, take off the small round piece of plaited straw from the top central hole, and quickly place a glass tumbler inverted over the hole, which effectually prevents a Bee from escaping to place itself in jeopardy or to annoy the operator. Then if the top of the hive is at all sunken, which is frequently the case, have small deal fillets (*fig.* 8), a trifle wider in diameter than the central hole of the adapter, and of various depths, to slip over the tumbler, and a wind of cotton wadding also to lay nearly around the outside circumference on the top of the hive. Then place on the permanent adapting board (*fig.* 9), when the tumbler will obtrude itself up through the flaphole, and no insect will ever be able to pass the cotton wadding one way, nor, by reason of the fillet, will the Bees be able to go between the hive and the adapter on the other. Now moisten the end of the adhesive paper, quickly take away the

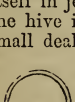


Fig. 8.

tumbler, down with the flap, press the adhesive paper on to the board, and place the super-board (*fig.* 10), which must have a flap in its centre to exactly correspond with the one below. Two guide pencil-marks on each board, previously marked, will point out their proper positions; and by reason of these duplicate openings in the flaps it will be seen by illustration to admit of two glasses (*fig.* 10 *a a*), being worked in lieu of one, which is

Fig. 9.

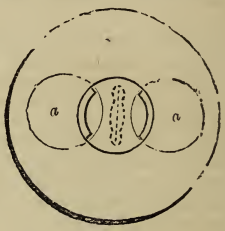



Fig. 10.

another great point gained in a good and early honey season. Now slip a carpet-bag over the glasses to keep them warm, and the super-over-hive over that; and then cover the whole with a brown glazed milk-pan.

*Fig.* 11 is a second small super-board to correspond with the above, excepting that the central hole remains without a flap; for, unless double supers are worked throughout the season, a third flap is unnecessary, and the super 3 inches high or so, and of any diameter one likes coming within the measurement of the board, is of wood, glass, or straw. These are mostly fig-drums cut in halves, or at least to the required depth, having a piece of glass let in nearest the board, so as to admit of one's seeing when the Bees have nearly completed their combs, and are ready for another. When the time arrives, when it will be seen by examination that the Bees have nearly completed their honeycombs in the glasses, and are in want of more room; all that one has to do to accommodate them is merely to lift up board and glasses, *fig.* 10, slip a board and super and fillet on top in its place, *fig.* 11, and set *fig.* 10 on the top of it, which will then represent *fig.* 13. The narrow fillet will prevent the board from coming flush down on the top of the newly-inserted super, which has a hole of only about 1½ inch in diameter in its top; a second small super-board would answer this same purpose—viz., leave a vacuum there for the Bees to ascend to complete the sealing-

Fig. 11.

over of their combs in the glasses, which they will presently do, and till when, of course, the pieces of carpeting and super-over-hive is reinstated.

Payne's straw supers are generally used for the third removes. They cost there about 1s. each of Mr. Major in the Traverse, Bury St. Edmunds, Suffolk.

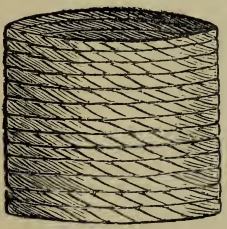


Fig. 12.

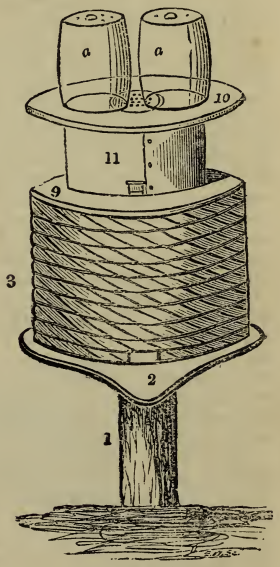



Fig. 13.

*Fig.* 12 is the super-over-hive, a foot deep, and about 14 inches inside diameter. Holes are worked in their tops, about 3 inches in diameter, the same as for the Bee hives, to allow the foul air to circulate up and away, or the top may be omitted altogether as is represented in engraving.

## THE STEWARTON HIVE.

During the last few years there have been great changes introduced in the form and arrangements of Bee hives, which have met with the highest approval of our best practical apiarians. Of these we shall just notice those which have

come in for the greatest share of favour, and which are obtainable at a price which is within the means of persons of ordinary income.

The Stewarton Hive may be said to have revolutionised the whole system of storifying bar hives. It has been in use for many years in Ayrshire, and their introduction to the south is due to the late Mr. Eaglesham, of Stewarton—an enthusiastic and very successful apiarian

These hives consist of boxes of an octagonal shape, three of which are set one upon the other and constitute a hive. The inside measure is 13¾ inches across from side to side, or from back to front. The height of the box, measured inside, is 5¾ inches. The bottom is perfectly open. The top is quite flat, and consists of seven fixed bars, each 1½ inch wide, placed parallel to each other in the direction from back to front. The spaces between the bars are three-eighths of an inch wide, and are capable of being closed by strips of wood, which slide in grooves made in the sides of the bars, and which can readily be drawn out behind when required. Across the middle of each box, at half its height, is a cross bar serving to support the comb. Windows with sliding shutters are placed in the back and front of each box, and an entrance is cut out of the front, 3 inches in width by half an inch in height, with a slide to close it to any required extent. In addition to the set of three boxes, a shallow honey-box 3¾ inches in depth, and without an entrance in the front, but otherwise made in precisely the same manner, is used as a super. These boxes being used on the storifying system, they are furnished with buttons and hooks for the purpose of securing them together.

The general outline of the management is as follows:—A swarm is hived into two boxes communicating with each other. When these are nearly filled with comb a honey-box is placed above, neatly furnished with guide-combs on the bars. When the Bees are fairly at work in the honey box, the third body box may be added below to give increased room and prevent swarming. In the winter this third box is removed, and the comb it contains left in, as it possesses a value well known to every skilled Bee-keeper. Feeding when required is liberally pursued, enough being given at once in the autumn to last till spring. The feeding-box, 8 inches square by 1½ inch deep, is divided by strips of wood into divisions half an inch wide. This is placed on the top of the hive, covered over with a box, and the slides withdrawn to permit the Bees to ascend to the food.

## TEGETMEIER'S HIVE.

A modification of the Stewarton boxes was proposed by Mr. Tegetmeier, who adopted the square forms instead of the octa-

gonal, and which certainly has this advantage over its prototype, that the moveable bars will fit any place in any box. The Stewarton may be described as consisting of two or more storifying-boxes, each furnished with seven loose bars to which the combs are attached. These are kept in their places by eight slides, which, when in position, render the loose bars perfect fixtures, so that the boxes may be inverted without the bars or slides losing their position. The size of Mr. Tegetmeier's boxes was originally $11\frac{3}{4}$ inches square inside, and of two sizes in depth—viz., 7 inches and 5 inches, but now he recommends them to be $13\frac{1}{2}$ inches square inside by 11 inches deep, each containing eight frames.

The plan of working the Stewarton and Tegetmeier boxes is the same. A very strong swarm, or two weak ones, are placed in two boxes, and when these are well filled, as may be seen by looking through the window behind, a honey box or glass is placed over, and communication made by withdrawing the slides.

## THE WOODBURY HIVE.

Best, by far the best, of all this form of the bar hive, is that introduced by Mr. Woodbury, who has done so much of late to extend our knowledge of, and acquaintance with, the habits of the Bee.

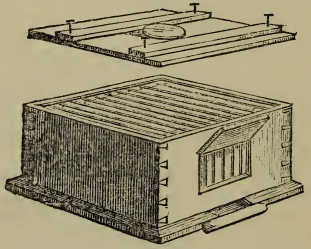


Fig. 14.

The following is Mr. Woodbury's own description of the hive, as it appeared in the *Journal of Horticulture*:—

"In compliance with the wishes of numerous correspondents, I have much pleasure in submitting to the readers of the *Journal of Horticulture* a description of my frame hives, supers, and outer cases, as at present in use in my apiary.

"Frame Hives are made of inch wood, $14\frac{1}{2}$ inches square, and 9 inches deep inside, dovetailed and put together with paint, the ends of the dovetails being pinned through with stout iron wire driven from the top and bottom, and meeting in the centre. A window $7\frac{1}{2}$ inches long by 4 deep affords a slight view of the interior from the back (not the front as engraved), but is much obstructed by the frames. The crown-board which is raised in the engraving, *fig.* 14, is keyed to prevent warping, and is secured by four long brass screws passing through the ends of the keys. A two-inch central hole for feeding is the only aperture, and this is closed when not in use by a circular

block of one-and-a-quarter-inch wood 5 inches in diameter. A three-eighth rabbet is cut out of the top inner edge at the back and front, and below this are notches seven-eighths wide by three-eighths deep, in which rest the ends of the frames. This arrangement affords the Bees a free passage above the frames as well as below and at their sides. The annexed sketch, *fig.* 15,

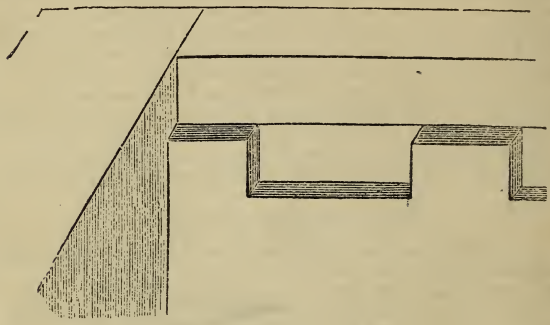


Fig. 15.

of the interior angle of one of my hives is drawn the full size, and will serve as a guide for the arrangement of the frames, which are ten in number, and are placed at equal distances apart.

"Compound Bar-frame.—This is a contrivance of my own, which I have found very advantageous in enabling me to use frames in stock hives and bars in supers without forfeiting the advantages arising from the unlimited interchangeability of every comb in every hive and super in the apiary. Its construction will be readily understood by an inspection of the annexed sketch, *fig.* 16, in which the comb-bar is shown slightly raised from its frame. The bar itself is 13¼ inches long by seven-eighths wide and three-eighths thick; these dimensions must be rigidly adhered to, as *every comb-bar should fit every hive*

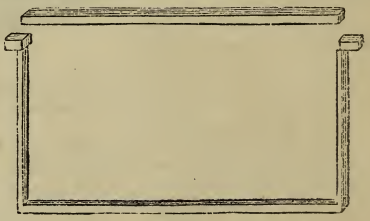


Fig. 16.

*and super in the apiary.** The slips of wood forming the frame are seven-eighths of an inch wide and five-sixteenths of an inch thick, with the exception of the projections at the top, which are the same thickness as the bars, and are five-eighths of an inch long. When the comb-bar is in its place the whole forms a frame 13 inches long by 7¼ inches high (inside measure), with a five-eighth projection at each end, which rests in its appropriate notch in either the back or front of the hive. The accompanying engraving, *fig.* 17, represents the frame filled with comb, in which state the bar becomes so firmly cemented to the frame as to admit of its being handled with the greatest facility.

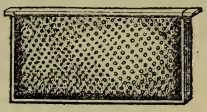


Fig. 17.

"IMPROVED COMB-BAR.—This little contrivance has proved very effectual in securing straight combs when guide-combs are not attainable. The annexed sketch, *fig.* 18, is a section of the new bar. It will be perceived that the lower angles are rounded off; whilst a central rib is added of about an eighth of an inch in breadth and depth. This central rib extends to within half an inch of each end, where it is removed in order to admit of the bar fitting into the usual notch. All that is necessary to insure the regular formation of combs is to coat the underneath surface of the central rib with melted wax. My practice is to use plain bars whenever guide-combs are attainable as these can be attached with much greater facility to a plain than to a ribbed bar; but whenever I put in a bar without comb I always use one of the improved ones. By this method

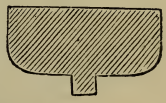


Fig. 18.

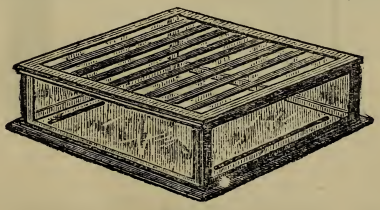


Fig. 19.

crooked and irregular combs are altogether unknown in my apiary.

* It is a good plan to commence by making a pattern bar of mahogany, which should be taken are of and used as a guide whenever comb-bars are required.

"Floor-boards.—My floor-boards are made of one-and-a-quarter-inch wood, keyed to prevent warping, are 18 inches square, and show a projection of about an inch beyond the exterior of the hive, from which they are chamfered down on all sides nearly three-eighths of an inch. An entrance 3 inches or 4 inches wide is cut in front out of the substance of the board commencing at the edge, and continuing on the same level until inside the hive, where it slopes upwards. The entrance formed in this manner is five-sixteenths of an inch in height where the hive crosses it.

"Alighting-boards are moveable, being attached to the floor-boards by means of a couple of pins of stout wire; they are made

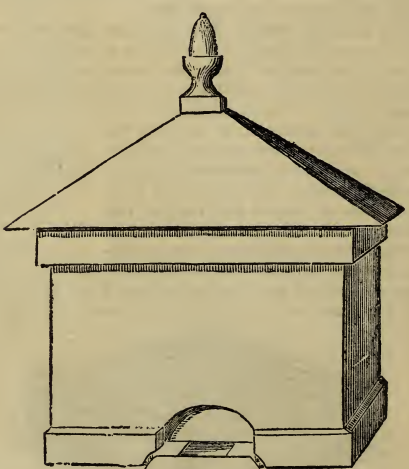


Fig. 20.

from a piece of a silk-roller, 2 inches in diameter by 8 long, rounded off at the ends, which when quartered makes four alighting-boards. The surface should be roughened by a toothed plane.

"Supers are 13 inches square inside and of various depths. Six inches deep is a convenient size, and, when filled, will contain nearly 30 lbs. of honey. The engraving, *fig.* 19, represents a very neat glass super of this size, which is manufactured by

Messrs. Neighbour. It shows also the adapter with its longitudinal communications near the sides of the hive, and which replaces the crown-board when a super is put on. As the honeycombs in supers are better when made of a greater thickness than those intended for breeding, I place only eight comb-bars in a thirteen-inch super.

"HIVE-ROOFS AND OUTER CASES are made of half-inch wood 11 inches wide. The former is separate, and is cross-bradded together at the angles with a two-and-a-quarter-inch turned acorn in the centre; its frame fits loosely over the cover and rests on angle-pieces at the corners. A half-inch opening is left under the eaves all round for ventilation. The hive-cover is dovetailed together and glued, with a brad driven through each of the tenons; it rests on the exterior projection of the floor-board, and is retained in its place by a plinth 2 inches wide, which fits loosely outside the latter. It must not be forgotten that all wooden roofs and outside cases require to be kept well painted, whilst no paint should ever be applied to the hive itself.

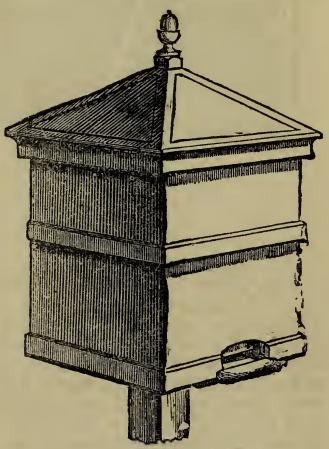


Fig. 21.

"When a super is put on a second outer case becomes necessary, and this fits loosely on the first, when the hive appears as it is represented in the annexed engraving."

## METHOD OF SECURING COMBS IN FRAMES.

When transferring combs into frames we temporarily secure them in position by the aid of slips of wood a sixteenth of an inch thick by half an inch wide, tacked on each side, and one or more zinc slips as delineated in the engraving.

All these artificial supports should be removed as soon as

possible. The combs will generally be found firmly fixed in less than forty-eight hours.

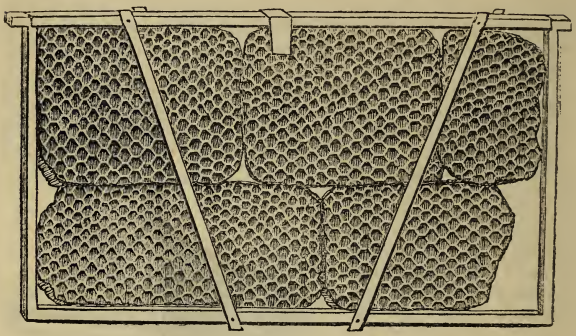


Fig. 22.

## SWARMING.

It frequently happens when Bees are managed upon the depriving system, that for want of timely room and ventilation being given, a swarm comes off from the stock hive, leaving the bell-glass, or small hive which has been placed upon it, in an unfinished state. Now, whenever this happens, let the swarm be hived into "The Improved Cottage Hive," and the bell-glass or small hive, with the adapter, immediately removed from the stock hive, and placed upon the newly-hived swarm; and as soon as the Bees are a little settled (say in fifteen minutes), remove the new-hived swarm to the place in which it is intended to remain, care being taken to fasten down the straw cover upon the parent hive; for no further profit can be expected from it beyond a second, and, perhaps, a third swarm, which are almost sure to follow. In this method of immediately removing a swarm to the apiary, Gelieu agrees with me, and for which he gives the following reasons:—"Most people who have Bees allow their swarms to remain till the evening in the place where they have alighted, and do not move them to the apiary till after sunset. This method has many inconveniences. As soon as a swarm has congregated in the new hive, and seems to be at ease in it, the most industrious among the Bees fly off to the fields, but with a great many precautions; they descend the front of the hive, and turn to every side to examine it thoroughly, then take flight, and make some circles in the air in order to

reconnoitre their new abode; they do the same in returning. If the swarm has taken flight in the morning, the same Bees make several excursions during the day, and each time with less precaution, as, becoming familiarised with their dwelling, they are less afraid of mistaking it; and thus, next morning, supposing themselves in the same place, they take wing without having observed where they have spent the night, and surprised at their return not to find the hive in the same place, they fly about all day in search of it, until they perish with fatigue and despair. Thus many hundreds of the most industrious labourers are lost; and this may be entirely avoided if the swarms be removed as soon as the Bees are perceived coming out: this sign is alone sufficient." Experience has long since proved that the custom of beating warming-pans, and the like, at the time a swarm leaves the hive is perfectly useless. Much trouble may be spared the Bees if the loose straws be removed from its interior; and the best method of effecting this is first to singe them with a wax taper and afterwards to remove them with a hard brush.

It is now an ascertained fact that the old queen accompanies the first swarm; the period which usually transpires between the first and second swarms is from nine to thirteen days; between the second and third the time is much shorter. If second swarms come by the middle of June, and stocks are required, it will be well to preserve them, for after-swarms have *always* young queens, which is a great advantage. Should second swarms not come till July, let them be returned to the parent hive, or put two of them together.

Symptoms of Swarming.—The symptoms preceding a *first* swarm are the rapid increase in numbers clustering, or hanging out, and drones becoming numerous and unusually active. Those of an after-swarm are much more certain, for, nine or ten days after the departure of the first swarm, a singular noise, called "piping," may be heard in the stock. The first note, says Mr. Golding, is long and plaintive, and is uttered by the princess already at liberty; she traverses the hive, and stops upon, or near, the royal cells which still contain brood, and emits her long plaintive note. This, when the other young queens are sufficiently forward, generally in about two days, is answered by them from *within* their cells in a quick, short, hoarse note; after these last have been heard for about two days the swarm may be expected to come off. Third swarms should either be returned to the parent hive, or added to a second swarm, for by themselves they are totally valueless. Sometimes an early first swarm, when additional room is not supplied at the time required, will send out another swarm: this generally occurs in about a month, but it is a thing by no means to be desired, and should carefully be prevented by giving timely room.

HIVING.—Whatever system is adopted let everything be in readiness for the reception of swarms, for even where the depriving system is followed, from some oversight on the part of the apiarian a swarm will occasionally occur. Watch the swarm in silence, and after it has once collected, lose no time in housing it into a *new*, clean and dry hive (its weight with the floor-board being first taken and marked upon it), and let it be placed where it is to remain within ten or fifteen minutes after the time of its being hived; it will not be necessary even to wait till the Bees clustered in front or on the sides of the hive are reunited to their companions inside, as they are never long in being so.

HIVES WITH COMB IN THEM.—Hives of comb, in which swarms of the last year have died, should be carefully preserved for hiving swarms into them; it gives a swarm treated in this manner full three weeks' advantage over another put at the same time into an empty hive.

PUTTING GLASSES OR SMALL HIVES UPON SWARMS.—The most proper time for putting the bell-glass, or small hive, or box, upon a swarm, will be from the eighteenth to the twenty-first day after their being hived; and should it be quickly filled, and more room required, which may be known by the crowded state of the Bees inside the glass, and by their being seen to cluster at the mouth of the hive at nine or ten in the morning, let no time be lost in lifting up the glass, and placing between it and the stock hive a small hive or box with a hole in the top. (See page 8). It is necessary to use this precaution at all times, but more especially in a rainy season, as a greater disposition amongst the Bees to swarm then prevails. "Dry weather makes plenty of honey, and moist of swarms," says good Mr. Purchase; and, however, incorrect this position may at first sight appear, the attentive observer will quickly become convinced of its truth.

SECOND SWARMS.—A second swarm generally leaves the hive about nine days after the first; but the time may be exactly ascertained by standing quietly beside the hive after sunset, when the queen may be distinctly heard "to tun in hir treble voic," (*Butler's Feminin Monarchi*, Ed. 1643), which is a certain indication that a second swarm will leave the hive. Should two or three queens be heard one after the other, it will be on the following day, if the weather be not very unfavourable. Should the queens continue to pipe after the departure of a second swarm, a third will *certainly* follow in a few days; but if one or two queens be found dead beneath the hive on the next morning, no more swarms can be expected.

## UNITING SWARMS.

I must here observe that second and third swarms are very seldom, if ever, worth preserving by themselves; but two second swarms, when joined, are very little inferior in value to a first swarm, and the union is very easily effected in the following manner:—When two second swarms, or a second and third, come off on the same day, hive them separately, and leave them till an hour and a half after sunset; then spread a cloth upon the ground, upon which, by a smart and sudden movement, shake all the Bees out of one of the hives, and immediately take the other and place it gently over the Bees that are heaped together upon the cloth, wedging up one side about half an inch, that the Bees outside may pass under, and they will instantly ascend into it and join those which, not having been disturbed, are quiet in their new abode. Next morning before sunrise, remove this newly-united hive to the place in which it is to remain. This doubled population will work with double success, and in the most perfect harmony, and generally become a strong stock, from which much profit may be derived.

Two second swarms, or a second and third, may be joined in the same manner, although one of them may have swarmed some days or even weeks later than the other; taking care, however, not to make the first one enter the second, but the second the first. A third and a fourth parcel of Bees may be joined to them at different times in the same way till the stock becomes strong. It is almost impossible sufficiently to impress upon the mind of every one who keeps Bees the necessity of having his stocks *all strong;* for weak stocks are very troublesome, very expensive, and seldom, if ever, afford any profit.

Mr. Taylor says, "The stronger the colony at the outset, the better the Bees will work, and the more prosperous it will become. I never knew a weak one do well long; and a little extra expense at first is amply rewarded by succeeding years of prosperity and ultimate profit." And again, "Thus strength in one year begets it in succeeding ones; and this principle ought to be borne in mine by those who imagine that the deficient population of one season will be made up in the next, and that the loss of Bees in the winter is of secondary consequence, forgetting how influential is their warmth to the earlier and increased productive powers of the queen; and how important it is, in the opening spring, to be able to spare from the home duties of the hive a number of collectors to add to the stores, which would otherwise not keep pace with the cravings of the rising generation.

It is a remarkable fact, that two weak stocks joined will collect double the quantity of honey, and consume much less, than two of the same age and strength kept separately. Stocks

must be joined after sunset, upon the day that one of them has swarmed; and the double stock must be placed upon the stand it previously occupied; great care must be taken not to shake the hive, nor must it be turned up. The combs being new and tender, will easily break, and the stock by that means be destroyed.

## VENTILATION.

Much has been said about ventilation, and many are the inventions for effecting it, but I have not seen one that is really efficient; its advantages, both in preventing swarms and in preserving the colour of the combs, no person at all acquainted with the management of Bees will deny.

The best ventilator that I have seen is this of Mr. Taylor's. "The ventilator I use," says Mr. T., "consists of double tubes, both resting on a flaunch in the hole prepared for them; the outer tube is of one-inch diameter, and 6 inches long, with six half-inch holes dispersed over it; it is soon fixed down in its place by the Bees, and so must remain. The inner tube is perforated zinc, with a tin projecting top as a handle, and a cap to put on or off this as required. The Bees will stop up the zinc tube when they can get at it, when it may be turned round a little to present a new surface; when wholly stopped it may be withdrawn from its place, and a clean tube substituted. This may be done without the least danger to the operator; but it should be inserted carefully, to avoid crushing any Bees that may have crept within the outer tube. An exit to these is afforded by the hole at the bottom. The substance with which Bees glue up all crevices and attach their combs is called *propolis*, a resinous exudation from certain trees, of a fragrant smell, and removable by the aid of hot water."

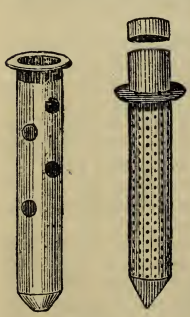


Fig. 23.

In adapting Mr. Taylor's ventilator to the small hive or box, the inner tube must be made without "the projecting top as a handle," and the cap made even with the flaunch.

After, all, however, the most certain, as well as the most simple, plan is to lift the stories apart upon small pieces of sheet lead, especially between the stock hive and glass box, or small hive in immediate connection with it. The stock hive itself may also be raised half an inch from the floor-board by blocks of wood of that thickness. This precaution is necessary only in very sultry weather, and when swarming is likely to occur.

No fears need be entertained at this time of robbers; for when honey is to be had abroad the Bees will not pilfer it from their neighbours at home. As soon as the very hot weather is over, it will be necessary to remove the blocks and restore the hives to their original position.

## FEEDING.

The best kind of food that can be given to Bees is honey liquefied with a small portion of warm water; but where honey is scarce and dear, an excellent substitute will be found in lump sugar. Three pounds of sugar to a pint of water, boiled for two or three minutes, and then mixed with a pound of honey, this will make five pounds of excellent food, which the Bees appear to like quite as well as honey alone. Or three pounds of lump sugar may be dissolved in two pounds of water by being boiled a minute or two. This is a very cheap and simple Bee food, and really answers every purpose.

Of all other kinds of food (where honey in the combs cannot be had) barley-sugar is the best, and not only the best and the cheapest, but the safest and by far the least trouble; for when liquid food is used it is carried down by the Bees immediately upon its being supplied and stored in the combs, and the proprietor has no means of knowing at what time the store is exhausted, and a fresh supply required; but it is not so with barley-sugar, for whilst a morsel remains, which may easily be seen, it is certain the Bees will not die of want. The best method of supplying it is at the top of the hives or boxes. My plan is to tie a dozen sticks of it together, and after opening the hive at top, to place the barley-sugar over the opening, and to cover it with a garden-pan or flower-pot; and just before it is all consumed, give a fresh supply in a similar way. Persons generally are apt to imagine that as soon as a few blossoms make their appearance in the spring their Bees will not want any attention, which is a very great mistake, as many a young apiarian has discovered both to his cost and disappointment; for during the months of March and April greater care is required in feeding than at any other time, for the population is then rapidly increasing, and in a wet and cloudy season no supplies whatever can be obtained but by artificial means.

To Make Barley-sugar.—Put two pounds of loaf sugar into a saucepan with half a pint of water, and two spoonfuls of the best vinegar; put it on a gentle fire, let it boil till the syrup becomes so thick that the handle of a spoon being dipped into it, and then plunged into cold water, the syrup upon the handle is found to be quite crisp; when this is the case it is sufficiently boiled. Having an earthen dish or marble slab in readiness, well

buttered, pour the syrup upon it, and, when sufficiently cool to handle, clip it with scissors into strips the size desired. The process of boiling takes about twenty minutes.

Feeding Bottles.—The very best mode of administering liquid food is by means of an inverted bottle, the mouth of which should be tied over with a bit of coarse leno or cap-net. It is a mistake to use muslin for this purpose, or, in fact, any material the meshes of which are less than a sixteenth of an inch wide. With common hives the bottle-neck may be inserted in the central aperture, which usually exists (if not, one should be made with a sharp penknife), in the top, and refilled as often as may be necessary. With flat-topped hives the bottle should

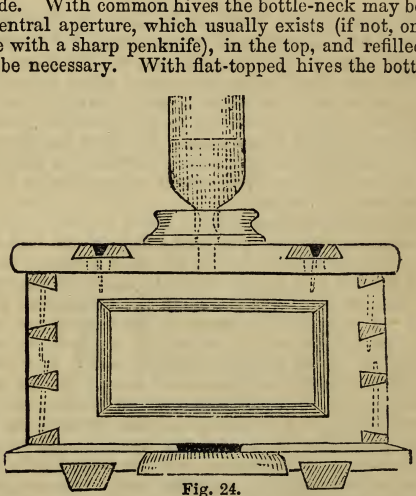


Fig. 24.

be supported by its neck being fitted into a perforated block of wood about five inches in diameter, and it will be found convenient to interpose a piece of perforated zinc to prevent the Bees escaping when the bottle is refilled. A four or six-ounce medicine phial is a good size for spring-feeding, whilst a common pickle-bottle leaves nothing to be desired when a copious supply is required in autumn.

A feeding-bottle should be filled by the food being poured into it from a jug, and if the neck be narrow it may, after the mouth is tied over, be quickly inverted over the aperture in the top of the hive, so that what food escapes may run into the hive and down among the Bees. If, on the other hand, the mouth be wide, as in the case of a pickle-bottle, it should be first inverted over the jug and steadily conveyed to the hive in a reversed

position When a bottle is properly managed no food runs down into the hive after it has been placed upon it, but all remains perfectly suspended whilst it is being gradually removed by the Bees, which find no difficulty in emptying a full-sized pickle-bottle every night.

FEEDING-PANS.—Having been frequently applied to for the plan of a feeding-pan best adapted for my Improved Cottage Hive, I am induced to answer the very many applicants by giving a description of the one I have been using for the last two or three years. It is made of stout zinc, circular, 8 inches in diameter, 2½ inches deep, having a circular hole of 2¼ inches in the middle of the bottom, with a rim round it standing up 2 inches; a float of wood, very thin and perforated with holes, is made to fit inside, but sufficiently easy to rise and fall with the

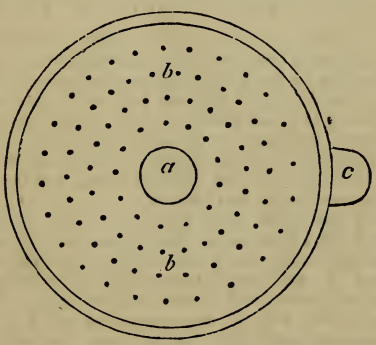



Fig. 25.

*a*, Circular hole through which the Bees ascend; *b*, The feeding-pan containing the food, which is put in at the side spout, *c*, and upon which the float rises and falls.

liquid in the pan; the holes in this float must first be made with a gimlet, and then burnt with an iron, or they will fill up after having been in use a little time; the whole is covered by a lid with an inside rim, the lid having a piece of glass in the centre of 2½ or 3 inches in diameter. When first using this feeding-pan, I found much inconvenience in being obliged to remove the lid every time that a fresh supply of food was required. To obviate this difficulty, I had a half-circle 3 inches in diameter, attached to its sides, with a lid or cover, and communicating with the interior of the feeding-pan by a hole cut in the side, and covered with a piece of perforated zinc, so that by looking through the glass in the lid I can see when a fresh supply of food is required;

and I have then only to raise the lid of this additional side-piece, and pour in the food, which passes readily through the perforated zinc, and raises the wooden float upon its surface. Four very small tacks should be driven into the under side of the float, at equal distances from each other, to prevent its going quite to the bottom of the pan; and it is also necessary for the rim in the centre of the pan to be roughed with a file, or to be lined with perforated zinc, to enable the Bees to ascend more easily than they would otherwise do if it was left quite smooth.

The float should be less than an eighth of an inch in thickness, and is better to be made of mahogany.

## MANNER OF TAKING HONEY.

At noon, upon a clear fine day, pass either a very thin knife or fine wire between the hive and the glass intended to be taken. If this precaution be neglected, a piece of comb is frequently left projecting from the top of the one left, or the bottom of that taken, which will cause much trouble to the operator. Two adapting-boards (see page 8) placed between the hive and the glass will be found very convenient, for the knife or wire will then only have to be passed between them, and the danger of breaking the combs thus be obviated.

To Expel the Bees from the Glass.—The glass must be lifted *very* gently, kept in the same position, and placed upon three inverted flower-pots, or something of the kind, in a shaded place, about 30 or 40 yards from the hive, and the Bees will make their escape in about ten or fifteen minutes. Gentleness, as I have before said, is very necessary in this, as in all other operations with Bees; indeed, it is the only means of accomplishing the end desired: therefore, remove the glass very gently, and place it about 6 inches above the ground on bricks or flower-pots, as above. Shaking, beating, or burning paper under it, have all a contrary effect than that desired upon the Bees: they are alarmed by this, and will not leave the glass for hours, and, perhaps, days when these means are resorted to. The glass being thus placed, a loud humming noise is first heard, and the Bees are then seen to leave it, and in five or six minutes all, except a few stragglers that may be brushed out with a feather, will have left it; but should the queen be in the glass, which very rarely happens, quite a different appearance presents itself—no noise will be heard, nor a Bee scarcely seen to leave it; but the hive from which it has been taken will, in a very short time, appear in great confusion. Whenever this occurs the glass must be returned immediately, and taken off again the next day. When a glass or box of honey is taken, it

must not be left till the Bees are all out of it, for it is very likely to be attacked by robbers, and a great part of it carried away in a short time. Robbers may be known by their endeavouring to *enter* the glass or box, while the Bees belonging to it, being separated from their queen, fly home immediately upon leaving it. I have frequently found it necessary, in order to prevent robbers from attacking the glass, to remove it from place to place every four or five minutes, or to take the glass into a darkened room, so that a small portion of light is admitted through a hole which communicates with the open air.

## STUPIFYING BEES.

By Fumigation.—Much has been said and written upon the subject of fumigation, yet this is a process that I am not at all partial to; and, as far as my experience has gone, it is one which I have never yet had occasion to resort to in a single instance; for even in the most difficult operations I have always found a puff, and that a very little one, of tobacco-smoke to be all-sufficient. As I have said before, gentleness is the best protection; still, if by any little accident the Bees become irritated, a slight puff of tobacco-smoke quiets them at once. One reason for my not being partial to fumigation is, that I could never see the necessity for it; and another reason is, that all the Bees which I have seen thus treated are sluggish and inactive for some days after the operation, besides many having been killed. Now, this in early spring, or in the midst of the honey-gathering season, is certainly of great consequence, especially when we are told that a prosperous colony of Bees will, in a single day of the latter season, collect from 4 to 6 lbs. of honey.

## METHOD OF DRAINING HONEY FROM THE COMBS.

Place a sieve, either of hair or canvas, over an earthen jar, cut the combs containing the honey into small pieces, and put them into a sieve; let them be cut in an horizontal direction. It is better to slice them twice—that is, at the top and bottom, than in the middle. Crushing or pressing should be avoided; for, as a portion of brood and Bee-bread generally remains in the comb, pressure would force it through the sieve, and the honey would thereby be much injured, both in colour as well as flavour. It is very desirable to have two sieves; for in every hive there will be two kinds of honey—the one almost colourless and fine-flavoured, found at the sides of the hive; the other dark and not so good, stored in the centre. These should always be kept separate. The draining process may occupy, perhaps,

two days; but the largest quantity, as well as the best quality, will be drained off in three or four hours. The honey should be put into jars immediately, and the jars *filled* and tied down with bladder; for exposure to the air, even for a few hours, very much deteriorates its flavour. I may here observe, that honey in the combs keeps remarkably well if folded in writing-paper, and sealed up so as to exclude the free entrance of the air, and is placed in a dry warm closet.

## PREPARATION OF WAX.

Having drained all the honey from the combs, wash these in clean water; this liquid, by exposure to the sun and air, will make most excellent vinegar; put them in a clean boiler with some soft water; simmer over a clear fire until the combs are melted: pour a quart or so into a canvas bag, wide at the top and tapering downwards into a jelly bag; hold this over a tub of cold water; the boiling liquor will immediately pass away, leaving the liquefied wax and the dross in the bag; have ready a piece of smooth board, of such a length that one end may rest at the bottom of the tub and the other end at its top; upon this inclined plane lay your reeking bag, but not so as to touch the cold water; then, by compressing the bag with any convenient roller, the wax will ooze through and run down the board into the cold water, on the surface of which it will set in thin flakes; empty the dross out of the bag and replenish it with the boiling wax, and proceed as before until all has been pressed. When finished, collect the wax from the surface of the cold water, put it into a clean saucepan with very little water, melt it carefully over a slow fire, skim off the dross as it rises, then pour it into moulds, or shapes, and place them where they will cool slowly. The wax may be rendered still more pure by a second melting and moulding.

## MEAD.

This treatise would not be complete without a receipt for Mead, the following is the best that I have seen, and is most excellent:—Pour five gallons of boiling water upon 20 lbs. of honey; boil, and remove the scum as it rises; when it ceases to rise, add 1 oz. of hops, and boil for ten minutes afterwards; put the liquor into a tub to cool. When reduced to 75° of Fahrenheit, add a slice of bread toasted and smeared over with a little yeast, let it stand in a warm room and be stirred occasionally; and when it carries a head tun it, filling the cask up from time to time. When the fermentation has nearly finished bung it down, leaving a peg-hole, which may soon be closed; bottle in about a year.

## HONEY VINEGAR.

A most excellent Vinegar may also be had from honey:—Put half a pound of honey to a quart of water, boiling hot; mix well, and expose to the greatest heat of the sun without closing the vessel containing it, but sufficiently so to keep out insects. In about six weeks this liquor becomes acid and changes to strong vinegar, and of *excellent* quality. The broken combs, after being drained, may be put in as much water as will float them, and well washed. The linens also and sieves which have been used for draining honey, may be rinsed in the same water, and with this make the vinegar; first boil and scum it before mixing it with the honey.

## REMEDIES FOR THE STING OF A BEE.

1. Persons who are much amongst Bees must now and then expect to meet with a sting, although to myself it very rarely happens; never, indeed, but when accidentally having laid my hand upon one, or when having pressed one beneath the sleeve of my coat. "The sooner the sting is extracted," says Dr. Bevan, "the less venom is ejected, and, consequently, less inflammation induced." After extracting the sting, I apply the least possible quantity of *liquor potassæ*, either with a fine camel's-hair pencil, a sharp pen, or even with the point of a needle. The venom of the Bee being an acid, this very powerful alkali neutralises it; the pain is instantly removed, and neither swelling nor inflammation follows. Care must be taken not to use too large a quantity or a scar will be the consequence, which will last for some days. Remember, the quicker the application the more effectual the cure.

2. The only *positive* and *immediate* cure for a Bee-sting that I have ever heard of, and that may be depended on in all cases, is tobacco. This remedy was recommended to me as an infallible cure; yet I had but little faith in it: still I tried it, and, as I supposed, properly, and found little or no benefit from its use. I reported its failure to cure in my own case to my informant, and he stated that I had not applied it thoroughly as I ought to have done; that he was certain that it would be an effectual cure, never having known it to fail in a single instance when correctly applied. The next time I got stung I applied the tobacco as directed, and found it to cure like a charm. The manner of applying it is as follows:—Take ordinary fine-cut smoking or chewing tobacco, and lay a pinch of it in the hollow of your hand, and moisten it and work it over until the juice appears quite dark-coloured; then apply it to the part stung, rubbing in

the juice, with the tobacco between your thumb and fingers, as with a sponge. As fast as the tobacco becomes dry, add a little moisture and continue to rub, and press out the juice upon the inflamed spot, during five or ten minutes, and if applied soon after being stung it will cure in every case. Before I tried it, I was frequently laid up with swollen eyes and limbs for days. Now it is amusing to get stung.—(*Miner's American Bee-keeper's Manual.*)

## BEE DRESS.

In the season for going amongst Bees careful apiarians are desirous of having all things ready for use before they are immediately required, and as being well-armed against the stings of their Bees gives confidence and coolness to the inexperienced operator, both of which are so essentially necessary to the successful accomplishment of his object, I will give the plan of a very simple and convenient Bee-dress, which has been kindly handed to me by a friend. It is formed of green leno, and so made as to enclose the head, neck, and shoulders; indeed, it is like a bag, with sleeves to tie at the wrists. The sleeves are made of green glazed cambric. It forms altogether a perfect panoply, and the most timid person with its aid may perform the most difficult operation with the greatest coolness, and without the possibility of being stung.

## PURCHASING STOCKS.

March and April are the best two months for purchasing stocks, and May for swarms. It is better to obtain them from such a distance only as they can be conveyed by hand; conveyance by any other means is always attended with danger to the Bees. Swarms require less care in carrying from place to place than stocks. In purchasing stocks the weight alone must not be relied on; a swarm of the preceding year should be selected, and one that contains not less than 12 lbs. of honey. The combs must be looked at, and if they are not of a yellow or straw colour, and if at all approaching to blackness, it is not a swarm of the last year, and must be rejected. The next best time to purchase is May or June, at the time of swarming; but of this hereafter.

## THE LIGURIAN OR YELLOW ALP BEE.

The Ligurian Bee is a species indigenous to the south of Europe, and has been cultivated in Italy in the same way as the common honey Bee has been in the northern parts of Europe

from time immemorial. It is the Apis Ligustica of the naturalist; and though so well known to exist and to have all the honey-producing properties of our own honey Bee, with some other advantages besides, it seems remarkable that it should have remained so long unknown to the apiarians of this country.

The merit of introducing this species is due to Mr. Woodbury, the eminent Devonshire Bee-keeper, who, having made the necessary preliminary inquiries, placed himself in communication with Mons. H. C. Hermann, of Tamin-by-Chur, in the Canton of Grison, Switzerland; and on the 19th of July, 1859, the Ligurian Bee was introduced to England.

In a pamphlet on the subject by M. Hermann we have the following particulars of this insect: —

"The yellow Italian Alp Bee is a mountain insect; it is found between two mountain chains to the right and left of Lombardy and the Rhætian Alps, comprising the whole territory of Tessins, Vetlin, and South-Graubunden. It thrives up to the height of 4500 feet above the level of the sea, and appears to prefer the northern clime to the warmer, for in the south of Italy it is not found. The farther one goes from the Alps, the less handsome they are found—as for example in Nice, until they are entirely lost in lower Italy in the black species. We must therefore look for the original in Switzerland, and we can call them with as much right *Apis Helvetica*, as the Genoese call them *Apis Ligustica*. Some learned men have called them Ligurian Bees, but that name has neither historical nor geographical claim, and not one Bee-cultivator of the whole district of the Italian Alp Bee knows what kind of insects Ligurian Bees are. The Alps are their native country; therefore they are called Yellow Alp Bees, or Tame House Bees, in contradistinction to the black European Bees, which we might call common forest Bees, and which, on the slightest touch, fly like lightning into your face.

"The Italian yellow Bee differs from the common black Bee in its longer more slender form, and light chrome yellow colour, with light brimstone-coloured wings, and two orange-red bands, each one-sixth of an inch wide. Working Bees as well as drones have this mark. The drones are further distinguished by the bands being scolloped like the spotted water-serpent, and obtain an astonishing size—almost half as large again as the black drones. The queen has the same marks as the working Bees, but much more conspicuous and lighter; she is much larger than the black queen, and easy to be singled out of the swarm, on account of her remarkable bodily size and light colour.

"The Bees are almost transparent when the sun shines on them.

"This race has nothing in common with the black Bees, which can be instantly seen by their ways and manner of building. The cells of the Italian Bee are considerably deeper and broader

than those of the black Bees. Fifteen cells of the Italians are as broad as sixteen cells of the black kind."

Their chief merits in contrast with the black Bees are—1, as they naturally inhabit a region of such elevation as 4500 feet, they are less sensitive to cold than the common Bee; 2, their queens are more prolific; 3, they swarm earlier and more frequently; 4, they are much less apt to sting, and not only so, but unless they are intentionally annoyed or irritated they are not inclined to sting; 5, they are more courageous and active in self-defence, and are particularly disposed to plunder the hives of the common kind; but should the latter attack their hives they fight with great fierceness and adroitness.

## TO UNITE A LIGURIAN QUEEN TO A COMMON STOCK OR SWARM.

As soon as you have become possessed of a Ligurian queen and her attendants, steps should be taken for removing the common queen from the stock, or swarm, to which the strangers are to be united.

Where *bar hives* are in use the operation is sufficiently easy, but should not be attempted without the protection afforded by a Bee-dress and a thick pair of wollen gloves. The services of an assistant similarly accoutred will be found very useful, but are not absolutely indispensable.

The middle of a fine day is the best time for the operation, which should be commenced by removing the stock a little either to the right or left of its usual position, which must be occupied by an empty hive, from which the top board and comb-bars have been removed. The top board of the full hive must then be shifted on one side sufficiently to expose a single bar, which may be carefully withdrawn after the attachments of the comb have been severed from the back and front of the hive by a bent knife. Both sides of the comb must be rigidly scrutinised, and any cluster of Bees gently dispersed with a feather, until it becomes evident that the queen is not present, when it may be placed in the empty hive. The same process must be repeated with each successive comb until the queen is discovered and secured, when the Bees may be either allowed to remain in the hive to which they have been transferred, or replaced in their original domicile. Sometimes the queen is not to be found on any of the combs, but may be detected among the stragglers remaining in the hive. In practised hands her discovery may be reckoned on with tolerable certainty during the first removal; but if she succeed in escaping detection the process must be repeated until she is secured.

With *common hives* or boxes driving is the best method to adopt; and the Bees, having been expelled from their habitation,

may be knocked out on a cloth and searched over until the queen is discovered.

Should the Bee-keeper be unable to perform the operation of driving, fumigation may be resorted to, and the queen secured whilst the Bees are in a state of insensibility.

Should the queen have been removed, and the Bees restored to their original hive and position in the apiary, measures must now be taken to introduce the Italian sovereign to her future subjects. The first step will be carefully to remove the lid of the small box, replacing it with a slip of perforated zinc without permitting the Bees to escape. The whole must then be inverted over an opening in the top of the hive containing the queenless stock, where it should remain undisturbed till the next day, when the perforated zinc divider may be withdrawn, and the union will be complete. The small box itself need not be removed till the third day, when the Bees will be found to have quitted it.

After the lapse of about thirty days young Ligurians may, probably, be discovered taking their flight.

## MULTIPLYING SWARMS OF LIGURIANS.

Presuming that the Ligurian queens are in bar hives, and that they prove themselves fairly prolific mothers, let a number of similar bar hives be provided, and into each of these, from time to time, during the course of the summer, let there be carefully transferred from the Ligurian stock a bar with comb attached, containing eggs and young Bees in every stage of progress.

It would be well that every full-grown Bee should be previously swept off this comb back into the old hive, so as to prevent all danger of fighting between them and the Bees of the other stocks to which the comb is to be given. Then, in the middle of a warm and sunny day, when the Bees are chiefly abroad, let this comb, carefully fixed in an empty bar hive, be put in the place of any strong stock of common Bees that may be available for the purpose. This stock may be removed to some distance; but it would be well first so to disturb it as to cause a good many more of the Bees to leave it than might happen to be foraging in the fields; and, moreover to stop up its entrance till the evening. The other Bees would soon take possession of the empty bar hive, and in three weeks' time replace their missing English queen with a young artificially-reared Ligurian queen, whose progeny would, in due course of time, become the sole possessors of the hive. The English stocks chosen for this purpose must be in the same, or in a very closely-adjoining apiary, otherwise the absence of Ligurian drones at the proper season would prove fatal to the success of this plan of increase.

One Ligurian stock losing one bar only, from time to time, might in this manner become the parent of a dozen stocks at

least in the same season; and the earliest of the young swarms (say those formed in May), might also, in a warm spring, be made productive of two or three swarms in the same manner, without becoming too much weakened. Indeed, two bars may be taken every week out of the Ligurian stock during the months of May, June, and July; and these swarms, artificially formed, in the manner above detailed, may be worked during at least a whole month, from the middle of June to the middle of July.

One good Ligurian stock should be left pretty much to itself, so as to encourage the propagation of drones. Still, even this stock might be made to yield a few bars without in the least rendering the development of drones; but no bars should be taken out till a fair number have been seen abroad. Perhaps the best plan would be to make a swarm out of this hive in the same artificial manner, so soon as many drones are hatched. For drones which join swarms are generally (perhaps always) allowed to remain alive till late in the season, whereas the earliest-hatched drones are frequently destroyed in cold springs in their own hives.

# BEE-KEEPER'S CALENDAR.

## JANUARY.

Little attention will be required during this month of cold and frost, except upon a mild day, should such occur, of cleaning the floor-boards with a dry brush, and looking well to the ventilation of boxes of all kinds; for however trifling these matters may appear to those who are inexperienced in Bee-management, the well-doing of many stocks during the coming season will, in a great measure, depend upon their being carefully attended to; and the interior of the hives being clean and free from damp at this time is quite as important as their having a supply of food in store, for even with the latter, if the former be neglected, the hives frequently perish.

Food.—When the hives are very weak—that is, having only two or three pounds of honey in store, I would recommend a few pounds of syrup being given—viz., one pound of loaf sugar, a quarter of a pint of water, and a quarter of a pound of honey, simmered together over a slow fire until the sugar is melted, and when cold given to the Bees, and at the top of the hive if possible; but where they have a little richer store, barley-sugar may be given instead of syrup.

Shade.—Many persons have advocated the sun's rays in winter not falling upon the hives. Mr. Taylor says:—"Where the hives stand singly, I have always seen the advantages of fixing before each a wooden screen, nailed to a post sunk in the ground, and large enough to throw the whole front into shade. This does not interfere with the coming-forth of the Bees at a proper temperature, and it supersedes the necessity of shutting them up when snow is on the ground. The screen should be fixed a foot or two in advance, and so as to intercept the sun's rays, which will be chiefly in winter towards the west side."

Ventilation.—Where boxes are used ventilation cannot be too much insisted upon, and a frequent examination of the floor-boards; and where dampness and mouldiness are observed, they should be exchanged for clean and dry ones.

Enemies and Snow.—The titmouse must be sharply looked after and destroyed as winter approaches, either by trapping, shooting, or bird-lime. Mice are also very apt to take up their winter abode inside the hives, where the single pedestal is not used; hence the necessity of a frequent examination of the hives.

See that the entrances of the hives are narrowed, and that during the time snow remains upon the ground they are wholly closed, so that not a single Bee can escape, for the sun shining upon the snow never fails to bring the Bees out of their hives,

and settling upon the snow, they are immediately chilled, and die; but, upon the disappearance of the snow, not an hour must be lost in unstopping the entrances, and giving the Bees full liberty. This is very important, for, after a confinement of ten or twelve days, which may sometimes be found necessary, full liberty must be given them, upon the melting of the snow, by unstopping the hives; and not only unstopping, but seeing that the entrances are clear, and not filled up with dead Bees, which, after a long confinement, will very frequently happen. Many a good stock has perished for want of this precaution.

Glasses and Hives.—The provident apiarian will now provide himself with all the glasses and hives, of whatever kind he may fancy, either of wood or straw, that he may be likely to require during the ensuing season; and it is always better to have a few to spare than to have a short supply, for it is not at all an unusual thing for a swarm to fly away whilst sending about to procure a hive; when on the contrary, had there been a good supply, much time and inconvenience would have been saved, as well as the loss of the Bees prevented. Many cottagers make their own hives during the winter evenings, and very praiseworthy it is; the materials to make them cost very little. Straw is easily obtained; brambles, also to sew them with abound everywhere; and the method of making them is very easily acquired. I would recommend a swarm never to be put into an *old* hive; the old hives will be useful as covers to glasses, and for hiving second and third swarms that are to be joined to others on the evening of the day they swarm. Where wood hives are used a second time, great care must be taken to make them thoroughly clean, and free from the eggs of moths.

## FEBRUARY

Very little attention will be required during this month beyond looking to the coverings, and seeing that they be all sound, and that no moisture comes upon the tops of the hives. Towards the end of the month, particular attention must be given at this season in endeavouring to keep the interior of the hives free from damp, which a frequent changing of the floor-boards will tend very much to effect. Indeed, after so long a confinement it becomes necessary, or the health of the stocks will be much endangered.

Feeding.—Food must be liberally supplied; but in so doing much attention must be paid to neatness and cleanliness in its administration, for when syrup is used the greatest care must be given that it be not smeared about the hives and floor-boards, for it will not only cause dampness in the hives, but induce fighting amongst the Bees when they are able to fly abroad.

Let the food be given, if possible at the top of the hive; if

at the bottom, not till after sunset, carefully stopping up the entrance of the hive, and removing the vessel in which the food was given before sunrise the next morning; for the appearance of the Aconite and Crocus will not only delight our eyes, and gladden our hearts, but they will also arouse our little favourites to life and activity; and as the supplies of honey from these flowers at this early season will be very small—sufficient only, perhaps, to create a desire for a larger quantity, the feeding-pan, therefore, if allowed to remain at the bottom of a weak hive, will be resorted to by all the Bees of the apiary, causing much fighting and loss of life, and very probably the destruction of the stock in which it had been placed. By feeding at the top, all this may be avoided; not only the trouble of removing the feeding-pan every morning, but the danger and loss certain to arise from fighting.

Stocks.—A careful examination of every stock should be made on a mild day towards the end of the month; and where any doubt exists as to the sufficiency of food in the hive to carry the Bees safely through the spring, a supply should now be given, and I must still recommend barley-sugar (where honey cannot readily be obtained) as the best food that can be given. A good receipt for making it may be found in page 25; but it must always be remembered, that where barley-sugar is used as food, the Bees should never be left, even for a day, without a supply, either at the top or bottom of the hive; the former is always preferable. It should be remembered, also, that it is much better to give food before the stock is absolutely in want of it, than to wait till its store of food is exhausted. There are many reasons for this, well known to every practical apiarian.

Promoting Early Breeding.—Binding the hives neatly over with haybands would be as little trouble and expense as anything. The end of the month will be the proper time for trying this experiment; and I have little doubt but, if carefully attended to, the result will prove to be all that is desired. The entrances to the hives, if large, should be reduced, so as to leave room only sufficient for the easy ingress and egress of the Bees.

Water.—It must not be forgotten to place water in the vicinity of the hives, as directed at page 43.

Enemies.—The chief enemies to guard against at this time are mice and birds; cold; if the floor-boards and hives are dry, affects them but little.

Hives of Comb.—Let the hives of comb in which swarms of the last year have died be carefully preserved for the purpose of putting swarms of the coming season into them. The best method of keeping such hives will be, after having cleared them of the dead Bees, to hang them up in a dry place out of the reach of mice or rats. The advantage which a swarm put into

a hive of clean dry comb has over one that is put into an empty hive is very great indeed, and known only to those persons who have experienced it.

Pollen.—By the end of the month our little pets will have begun their labours for another year, in collecting pollen from the Winter Aconites and the early kinds of Crocus, and, if the weather is not very severe, from the Elms also. Some years since I was curious to learn from what a grey or ash-coloured pollen was obtained, which the Bees brought home in rather large quantities very early in the season, at a time when the Aconites only could be seen in flower; but happening to pass beneath some Elm trees on a bright day, to my surprise I heard the hum of Bees, and on looking closely I observed several very busily employed, which induced me to take a branch home, and by comparing under the microscope the pollen, which it shed abundantly on being placed in a warm room, with that brought by the Bees, I found them to be alike, which fully satisfied me in this matter.

Pedestals.—Where the stocks are placed upon pedestals of wood it will be well to look to them, for I have lately heard of some sad disasters arising from the want of this little attention. It is about an inch below the surface of the ground that the mischief takes place, and when once begun, goes on rapidly, except good oak has been used.

## MARCH.

Our little favourites, by the appearance of the early spring flowers, and the return of milder weather, are again aroused into life and activity; but it must always be remembered that the most trying time for them is from the middle of February to the end of March; for none but well-stored stocks can bear up against the great inequality betwixt the internal demand and the external supply of this period. The winter, to be sure, has been very cold, which is generally in their favour; for but little, if any, evil is to be apprehended from a cold winter, though much may arise from a mild one; as, during the latter, the stock of honey is often exhausted, from its inducing the Bees to be in action, without affording them any resources beyond their own stores.

Diseases.—This is the month in which dysentery and other disorders make their appearance amongst the Bees; but cleanliness and timely supplies of food are the best remedies, and which are always found to prevent it.

Spring-feeding, however, must be done sparingly; for if the Bees have had a sufficient winter's supply, feeding will only be required on a small scale, and to those that are weak, it being

chiefly intended as a stimulant to promote early breeding. A hive that has less than 5 lbs. of honey in it is a weak one.

The importance of feeding is very great; for languor and death, says Dr. Bevan, are less frequently to be ascribed to disease than to the want of timely food.

Hives.—The time has now fully arrived for all careful apiarians to possess themselves of as many hives, glasses, boxes, bee-dresses, &c., as they are likely to require during the coming season; and to those who prefer the use of straw hives I would say (and that most emphatically), Never put a swarm into an old hive. Mr. Huish has said, and with much truth, that old hives are generally so overrun with vermin of an obnoxious character to Bees, that, even should the swarm condescend to remain in them, the ensuing winter will place the hive in such a ruinous state, that the Bees will forsake it in search of a more salubrious domicile, or the contents of the hive will be destroyed by the insects. Boxes that have been already tenanted should be cleaned most carefully, and boiling water from the spout a tea-kettle poured over the joints where the eggs of the wax moth—that redoubted enemy of the Bees—will very probably have been deposited.

Haybands.—I have put in practice, with my own Bees, what I recommended last month—namely, covering some of my hives with haybands. The good, should any be found to arise from it, in promoting early breeding, shall be communicated in due course.

Cleaning Floor-boards.—When performing this operation, should the hives be found to be at all damp or mouldy, take the precaution of raising them a little for a few hours on a dry day.

Snow.—Should we after mild weather have snow, it will be necessary to keep the entrances of the hives stopped whilst it remains upon the ground, or the loss of life will be very great, which, at this season, should be more especially guarded against.

Examination.—Immediately upon the disappearance of snow, every hive should be carefully examined, and clean floor-boards supplied wherever the least dampness is observed.

Bees Gathering Pollen.—Bees may now be seen upon a bright day in the Aconites and early kinds of Crocuses, collecting the little pollen and honey which they afford; and it is but little indeed—only just sufficient to arouse the workers to activity, and the queens to depositing their eggs: therefore, without careful and constant feeding, death by starvation must follow, for I imagine that not one stock in ten has sufficient honey in store to support it through the winter and early spring.

Forsaking Hives.—Where the population is low, and little or no food in store, the Bees are very likely, upon a fine and mild day towards the end of the month, to forsake their hives entirely, and to join themselves to more populous and better-

stored communities. This desertion, when it happens towards the end of April, is frequently mistaken for an early swarm. The only means of prevention is to keep them well supplied with food; but even this will not, in all cases, keep them from leaving their hives.

Wasps.—It will be well, during the present and the next month, to be looking for queen wasps, and destroying every one that makes its appearance. A garden syringe is the most useful thing I have ever found to effect their destruction, for if discharged at them, it brings them to the ground, and the foot then finishes the business.

Buying Stocks.—March is a good time for purchasing stocks for those who are desirous to become Bee-keepers; and there is sufficient encouragement, I think, to induce many persons to engage in it, for their cultivation, if properly managed, is attended with very considerable advantage, much more, indeed, than what is generally supposed, and would not be by any means a contemptible consideration with even those who may fill a superior rank in the rural population of our country.

## APRIL.

April may be considered the first month of the apiarian's year, a month of busy preparation for the coming honey season and its many pleasing occupations. A good supply of new straw hives (where they are used) is supposed to be already in hand, with glasses and covers, depriving-hives, adapting-boards, Bee-dresses for the operator and an assistant, and indeed, of everything that will be required during the season.

Feeding.—I must again press upon all persons who have weak stocks the necessity of feeding. The Bees are beginning to bestir themselves when the sun shines warm; and inexperienced Bee-keepers are apt to think that their stocks are now past danger, and so take no more care of them. But the truth is, that the early spring months are the most dangerous of all; many stocks that have stood the winter die in the spring, which a few ounces even of food would prevent. There is nothing to be gathered in the fields till April, and in cold late seasons not much before even May. Stocks should be watched well in spring, and weak ones fed liberally. As soon as they begin to stir a little food should be given them every other day, or thereabouts, until they refuse to take it, for they will neglect the food given them as soon as they can gather honey.

Method of Feeding.—The best manner of giving food to Bees in a common straw hive is to put it into a dinner-plate, cover it with a piece of writing paper thickly perforated, and place it under the hive; but should there not be sufficient room

for the plate without touching the combs, the hive may be raised upon a wooden hoop, the exact size of the hive, and about 2 inches deep, or upon a piece cut from the bottom of an old straw hive. The food must be given after sunset, and the plate removed by sunrise the next morning. The entrance must be stopped while the food remains in the hive; a piece of soft paper answers remarkably well for this purpose.

Water.—This must be supplied to the Bees immediately, for it is in the spring that they have the greatest occasion for it. The plan that I have adopted is to have a trough of wood, or stone, 18 inches long, 12 inches wide, and 6 inches deep, sunk in the ground in the immediate vicinity of the apiary, with a piece of thin wood, thickly perforated with small holes, made to fit loosely into it. This perforated wood, when the trough is filled with water, will float upon its surface, and save the Bees from drowning—a mode of death causing the loss of numbers should they, for want of this little accommodation, be obliged to go to an open cistern or pool.

Hives.—It is now quite time to have a supply of hives for the coming season, where new ones are required; and where old ones are to be used, to have them well cleaned. It is also a good time to paint those hives that are occupied—it will greatly improve their appearance, as well as tend to preserve them. A well-made hive, painted before the Bees are put into it, and once every other year afterwards, will last uninjured for upwards of twenty years; indeed, I have one at the present time that has stood even much longer. They may be painted after six o'clock in the evening without danger to the operator or inconvenience to the Bees; of course, stopping the mouth of the hive for the time. I find stone or straw colour to be the best, as absorbing less heat than green or any dark colour. Perhaps, on this account, white would be best, but the strong reflected light from it is very objectionable.

Floor-boards.—It will be well to give the floor-boards a final cleaning for the season, and the middle of a bright day will be the best time for doing it; and, at the same time, any pieces of comb that during the winter may have fallen from the top of the hives, and are fastened by the Bees to the bottom of the combs that are in their proper places, should be removed.

Cutting out Old Combs.—This is also the best time to remove a leaf or two of comb from old hives, perhaps the two outermost ones, but not any more. The box hives are admirably adapted for this operation; still, with a proper knife (the one figured in page 57), it may easily be effected in the straw hive.

Putting on Glasses, &c.—It is very probable that at the end of the month some of the most populous hives may require supering, as it is termed, but I would advise its not being done too soon; indeed, not till the Bees have shown evident signs of

want of room, for it is exceedingly desirable that the stock should be in such a state as to ascend into the super immediately upon its being placed upon the stock hive.

Guide-combs.—I would recommend guide-combs being fixed in glasses of every kind that are to be placed either on hives or boxes. The Bees are induced thereby to commence working in them sooner than they otherwise would do; and it must always be remembered, that simply putting on a glass, a box, or a small hive, will not prevent swarming, except the Bees commence working in it, which a small piece of comb fixed at the top induces them to do more readily. Upon each of the side-bars, nearest the centre one, a small piece of comb should be fixed. This is easily effected by heating a common flat-iron, slightly warming the bars with it, then melting a little Bees-wax upon it. The comb is now drawn quickly across the heated iron, and held down upon the bar, to which it firmly adheres, if properly managed. These pieces of guide-comb need not be more than 2 or 3 inches in diameter. Care should be taken that the pitch, or inclination of the cells, is upwards from the centre of each comb. Drone-celled combs for this purpose are to be avoided, as well as those with elongated cells. Glasses will be provided, and guide-combs fixed in them also.

Pollen.—This is not a busy month for the apiarian only, but for his Bees as well in bringing in pollen. Mr. Golding tells us that the neighbourhood of Willows is of great advantage to the Bees in early spring. Should a few fine days accompany their flowering, many hives will be enabled to ward off the impending famine which but too often then threatens. He says that from the 20th to the 30th of March, in 1830, the weather was so favourable as to enable the Bees to make an extraordinary collection. Single hives in some days gained in weight upwards of 3 lbs. each, and worked in wax where room was given as vigorously as at midsummer. The spring of 1841 was a very similar one; and he says that his hives on the 16th of March of that year gained from 2 to 3 lbs. each during the day.

The whole tribe of Crowfoots are now making their appearance, all of which are eagerly sought after by the Bees, but more especially the Pilewort (*Ranunculus ficaria*), which affords them such an abundance of pollen during the months of March and April, and which abounds in meadows, pastures, and hedge-banks. Seeing an abundance of it carried into a hive is a sure proof that the stock is in a healthy and thriving state; but let it be remembered that pollen has nothing whatever to do with supplying the Bees with food, for they will die from starvation with the combs filled with pollen, for it is only in the larvæ or grub state that they eat it: therefore, if the stocks have not a store of honey, go on to give barley-sugar.

Young Bees.—The population of every healthy stock of Bees

is now rapidly increasing, and numbers of young ones may be seen upon every sunny day crowding the entrances of the hives to exercise their wings for the first time, which they may be observed to do with the greatest caution, running from side to side of the alighting-board before venturing to fly. The imperfect nymphs, also, are strewed upon the hives during the night to be carried away by the Bees as soon as the hour of labour commences. This circumstance also indicates a rapidly increasing population. A very large quantity of food is consumed by the young Bees while in the larvæ or maggot state, which draws very heavily upon the store of the food of the hive. It, therefore, behoves the apiarian to look attentively to all weak stocks, and more especially to swarms of the last year, and to let them have a regular supply of food; and, for those who like but little trouble in feeding, dry barley-sugar is, unquestionably, the best mode in which it can be administered; it may be given either at the top or bottom of the hive, for it does not, like liquid food, attract robbers to the hives that are supplied with it.

Drone Bees.—Drone Bees usually make their appearance towards the middle or the end of this month; their first appearance is very gratifying to the Bee-keeper, for it proves to him that his stocks are in a healthy and prosperous condition. It is said that the celebrated apiarian Bonner was always so delighted at their first appearance, that he made the day one of festivity and rejoicing for himself and all his family.

Robbers. — As considerable robberies frequently take place in this month among the Bees, attention is required to discover if any hives are attacked; and when it is found to be the case, it will be necessary to narrow the entrance of the hive, so that only one or two Bees at most can go in at the same time. The weak stocks, in general, are those that suffer from pillage. Robber Bees may easily be distinguished from others, for they fly rapidly round the hive, and hover before the entrance for some time before alighting; and when they venture to do so they are generally seized by some of the sentinels which guard the entrance.

Queen Wasps.—The destruction of queen wasps, which are now beginning to make their appearance, will prove the best security against their progeny, those formidable enemies of the Bee. In April and May they are very easily captured, and every one now destroyed would probably have been the founder of a nest, whicmay be computed at 30,000 at the least.

Moths.—Moths are by far the most dangerous enemies the Bees have to contend with. It is the caterpillars of these moths which gnaw and destroy the combs; and they would soon be ruined by these insects, if the Bees did not offer the greatest opposition to their ravages. The perfect insect (*Galleria cerreana*

and *Galleria alvearia*) may be seen fluttering about the hive at sunset, from April to October, and should be promptly destroyed whenever observed.

## MAY.

The most interesting as well as the most active month in the apiarian's calendar has now commenced; food for his little favourites abounds in every direction, and no fear need now be entertained of famine. The population of the hives will have increased considerably, and drones by this time are making their appearance, which proves that the stocks are in a healthy and vigorous state, and should be a subject of congratulation to every Bee-keeper. "*Early drones, early swarms,*" is a maxim, the truth of which every experienced apiarian is well acquainted with.

To those persons who are managing their Bees upon the depriving system, the time will now have arrived for supplying each stock with a small hive, box, or bell-glass; and should the season prove a favourable one, the supply, also, of a second may be found necessary before the end of the month.

Method of Placing the Bell-glass, Box, or Small Hive upon the Improved Cottage Hive.—Take the moveable piece of straw-work from the top of the hive (see page 8), and place it upon the adapting board (see page 8); then put the bell-glass, small hive, or box (see page 8), upon this adapter, and cover the whole with a milk-pan to defend them from wet. Should a bell-glass be preferred, it must be covered with something that will effectually exclude light. A cover of straw is, perhaps, the best. It is very desirable to fix a piece of clean comb inside the glass, and this may very easily be done by warming the perforated zinc tube, which is sold with the glasses, and then pressing the piece of comb upon it. Should the comb reach from the top to the bottom of the glass, so much the better; for the Bees will then begin to work upon it immediately.

Those persons whose Bees are now in common straw hives may, if they please, commence with the above system at once. Let them in the middle of a fine clear day, with a strong sharp knife, cut out from the top of the hive a piece of the straw-work, 4 inches in diameter, and then place over the opening the adapting board, &c., as directed above. Should the combs be a little broken at the top of the hive it matters not. Indeed, it is rather to be wished that they should be so; for the Bees in repairing them are induced to carry their work upwards in the glass or box that is given them. This operation may be done without any protection whatever by an experienced person; for if done at a proper time and well managed, not a Bee will take wing. All operations, except joining swarms, should be performed on a

fine clear day, and between the hours of twelve and two o'clock. At the same time, such operations are done with much less annoyance to the Bees, as well as with less chance of danger to the operator. I generally perform all the operations required in this system without the defence even of a pair of gloves; but I would not recommend any person to do so until he has had many years' experience in the management of Bees; for being perfectly defended in every part against their stings, gives that coolness and confidence to the operator upon which the happy accomplishment of his intentions so much depends. Coolness and confidence on the part of the operator are essential qualifications; for anything approaching to hurry irritates Bees exceedingly. Indeed, the hand ought never to be hastily removed from one position to another. "Quietness," says Dr. Bevan, "is the surest protection against being stung."

Defence.—The best defence that I have found is a mask of wire similar to a fencing mask, and a pair of very thick worsted gloves. It should be remembered that nothing is either more offensive or more irritating to Bees than the human breath: therefore, the breathing upon them must at all times be most carefully avoided.

Covering for Glasses.—When the Bees are beginning to work in a glass, a cold night generally obliges them to forsake their newly-made combs, and to discontinue their labours, which are seldom resumed till the middle of the next day. To prevent this delay, I would recommend the space between the glass and its cover to be filled with fine tow or wool, the temperature of the glass being thereby kept up, and the Bees enabled to carry on their labours without interruption. Wool is to be preferred from its not being so good a conductor of heat as tow.

Hives.—The time has now arrived for those persons who are wishing their Bees to swarm to have a supply of hives in readiness; and where straw hives are used, I would recommend new ones in all cases, except where a swarm of the last year has died, and the combs still remaining in the hive, the combs being dry and free from mould. A hive of this kind is a great help to a swarm; for one treated in this manner will generally be found better than one a fortnight or three weeks earlier that has been put into an empty hive.

Depriving-Hives, or Supers.—It will now be time to have small hives, boxes or glasses, in readiness to place upon stock hives. Each box, or glass, should have a few pieces of guide-comb neatly fixed in it; but refrain from putting them on until there are evident signs of want of room. This may be ascertained by the Bees thickening at the entrance, and by a loud hum inside; for if put on too early it will retard the hatching of the brood, as well as give the Bees an unwillingness to enter it at all. The most desirable time for placing a glass or box

upon a stock hive, is the exact time when they will enter it immediately; but the knowledge of this, I am aware, is attended with some difficulty. I have always found, that by giving a glass too early in the season, Bees appear to take a dislike to it, and will swarm rather than enter it. When I have been able to put a glass upon a crowded hive at about nine o'clock on the morning of a warm day, it has scarcely ever failed to be filled with Bees immediately. Be the super of wood, glass, or straw, a small piece of guide-comb is a great inducement to the Bees to begin working in it at once.

Ventilation.—It has been my practice for some years to give all the ventilation possible to my stocks in boxes, by withdrawing all the slides about October, and keeping them open to the end of April: for then no condensed vapour can injure either the combs or the Bees, and then shutting them for a week or two before putting on the glasses, so that, upon again opening them, the Bees immediately take possession of the supers, and begin their work in them.

Driving Bees from one Hive to Another.—I am frequently applied to by beginners for the best plan of removing a stock of Bees, at this season, from an old hive to some fancy one they have chanced to meet with, and I have, in all cases, said that it is a plan I have never either adopted or recommended. Let the Bees remain in the old hive, and if it be too unsightly to be tolerated, have a tasty cover of wood or zinc made to fit it and let them swarm, and put the swarm into the new hive. If a weak one, join the second swarm to it; if not, hive the second swarm in the usual manner, and then in September, either by driving or fumigating the Bees in the old hive, join them to the second swarm.

Swarms.—Those persons who are anxious to commence Bee-keeping by purchasing swarms, must now provide themselves with such kinds of hives as they are wishing to see their Bees placed in, and send them to the persons of whom they have agreed to purchase, that the Bees may be hived into them at the time of swarming. Should it be straw hives that are chosen, let there be no sticks placed withinside them for the Bees to fasten their combs to, for they cause them much trouble in forming the combs, and render the extraction of the combs almost impossible. Let there be no sugared ale nor honey put inside the hive, but let it be as clean and dry as possible; and when it is fixed where it is to remain let there be no mortar or clay put round to fasten it to the floor-board—the Bees themselves will do this more effectually. Clay or mortar tends very much to decay the hives by retaining moisture, and is a harbour for moths and other insects. On the depriving system, a hive may be expected to stand for fifteen or even twenty years, if properly managed.

Purchasers should endeavour to obtain the very earliest swarms in May, if there be any, but on no account to have them after the 14th or 15th of June; and it is very important to observe, that whenever a swarm is purchased, it must be removed to the place in which it is to remain upon the evening of the day it swarmed; for should its removal be delayed even till the evening of the next day, the combs will in all probability be broken, and the stock destroyed. Let it be remembered, that the prosperity of the hive will much (perhaps entirely) depend upon its being finally placed upon the evening of the day it swarmed. It must be a very peculiar kind of day to induce a first swarm to emigrate. It must be a balmy still day, and something besides that I cannot discover, for there may be several days to all appearance alike, and upon one of these days everybody's Bees shall swarm, whilst not another swarm, perhaps, shall be heard of on any other day for some time. This late swarming will be a sad disappointment to those who are commencing Bee-keeping this summer, who indeed, are not a few; and I congratulate each one of them, for they will find in the management and observation of their Bees a constant and increasing source of interest and amusement.

Premature Swarms, or the whole population of a hive leaving it, and alighting at a distance from it; in the usual manner:—This generally happens early in May. The best plan that can be adopted in these cases is to unite the Bees to another stock, if they should not join one of themselves; for if put into a hive they generally leave it or die. The cause usually arises from poverty, or the old age of the queen.

Should we have a dry May, swarms may be expected at the end of the month: therefore it will be good policy to have every arrangement for their reception made in good time; but June must be the month for honey. "None in June, none afterwards, depend on it." The honey harvest comes on all at once, and very seldom lasts longer than a fortnight, so that additional room should be in readiness if required.

Enemies.—Queen wasps are now showing themselves, and should be sought after and destroyed, both by gardeners and apiarians. A few mild days in February usually tempt them out, when the cold which follows kills them, or renders them so feeble as to be easily captured; but now they come at once from their hiding-places to a temperature of 60°. The destruction of the queens, therefore, is important both to the gardener as well as to the apiarian; and, as soon as they are seen to alight, discharge a syringe full of water upon them, which is sure to bring them to the ground, when they may be crushed easily with the foot. Watch carefully for moths. Should the Bees of any hive appear inactive about this time, or should they not be seen to carry in pellets of pollen, whilst others are doing it, and this

inaction continue for eight or ten days, lose no time in examining the hive; and should the moths have begun their work of destruction, which may be known by seeing their combs joined together by their silken webs, cut away the combs affected with a sharp knife, and the hive may perhaps be saved.

The house sparrow may also be ranked amongst the enemies of Bees, for I have observed, for the last four or five years, the female birds flying from the ground up to the mouth of the hive, and catching the Bees just before, or as they take wing, and away with them to their young ones when their nest is nigh the apiary. I have seen as many as six or eight journeys made in a quarter of an hour by the female bird only. The male appears to take no part in it. I have never witnessed the like at any other time but when the birds have young to provide for; therefore it would be well to have all the nests in the immediate neighbourhood of the apiary destroyed.

Feeding.—Weak stocks must still continue to have barley-sugar supplied to them, for during the prevalence of north and easterly winds but little food can be collected.

Pollen.—Those stocks that are alive will be carrying in pollen most abundantly of a golden yellow colour, which is obtained from Crowsfoot, Ranunculus ficaria, and Ranunculus bulbosa, but more especially from the former, it being the earliest as well as the most abundant; for next to the Dandelion, it makes our meadows brilliant. It is Shakspeare's "Cuckoo-buds of yellow hue," and greatly indeed are our little favourites indebted to it for a supply of food for their early progeny. The Crocus lasts but a short time, and is met with only in gardens, while this covers almost every meadow in the kingdom during the months of March and April: therefore, how little advantage arises from cultivating Bee-flowers, as they are frequently called, for it is the fields, and the fields alone, that supply their store of honey. Sow twenty acres of White Clover within a mile of them and leave it for seed, and in the autumn twenty or thirty acres of Buckwheat, and much benefit will arise; but the little that a garden affords them is almost valueless.

## JUNE.

It will now be time to place *glasses* or *small hives* upon such stocks as are not intended to swarm, and it will be well not to do it until the bees begin to show evident signs of want of room; for then they will ascend immediately into the glasses, and commence working; but on the contrary, when they are put on too early—that is, before the stock hives are full with Bees, they will not go into them, but frequently swarm in preference; and besides, opening the hive to put on the glass before it is full with

Bees causes a circulation of cold air through its centre, which tends greatly to retard the hatching of the brood.

Guide-combs.—A glass should never be put on without having a piece or two of guide-comb placed at the top, which may easily be effected by first warming the zinc tube, and then attaching the comb to it whilst in that state.

Glasses.—For the method of placing glasses, small hives, &c., on the Improved Cottage Hive see page 54, and for the treatment of swarms generally, taking honey, expelling the Bees from glasses, &c., see page 56.

Bar Hives.—Persons who have possessed themselves of these excellent hives are by this time anxiously looking for swarms to put into them, or quite as anxiously watching the progress of those already at work in them. The guide-combs being properly fixed will insure their working regularly upon the bars of the stock box, but not quite so surely upon those of the upper one; for, notwithstanding every precaution being taken to prevent it, they will sometimes commence working their combs from the top of the stock box, which forms the floor of the upper one. This must be attentively watched for the first three or four days after opening the communication between the boxes, and any comb observed in this position must be immediately removed.

Artificial Swarms.—The present is a good time for obtaining artificial swarms, and where any form of the "Bar Hives" is used, the process is very simple, and may be thus effected:—From ten to twelve o'clock, on a bright morning, remove the board from the top of the parent hive; select a bar, the comb on which contains both eggs and brood, and if a royal cell, all the better, but this is not important; place the bar with comb in some convenient place, so that it is neither bruised nor separated from the bar; then turn up the parent hive, after having fastened down the top, and place the one intended for the new swarm upon it, observing that the junction is perfect; then, by a continuous gentle tapping upon the parent hive for a few minutes, a portion of the Bees will have ascended into the hive. Remove the parent hive 60 or 100 yards, placing it upon a fresh floor-board, and place the new hive exactly in the place of the old one, and upon the same floor-board; and, as quickly as possible, introduce the bar of comb filled with eggs and brood into its centre, replace the top, and endeavour to have the exterior of the hive as little altered in appearance as may be; it will then be found that the few Bees driven into the new hive, with the number returning to it that were out at work, with some that may come from the parent hive, will altogether make a fair-sized swarm. The parent hive will, in all probability, give another swarm in about fourteen days.

Swarming.—The time for swarms is now very nigh at hand,

if we are to have any; but in weak stocks it is not very desirable. However, if they come, the best must be made of them. By all means let the new swarm be placed where it is to remain as soon as it is settled in its new hive, which rarely exceeds ten minutes. This will save the Bees much loss of time, as well as numbers of them their lives. When there is dull and cold weather in March and April, and even May, many stocks become weak and feeble, and numbers entirely perish; therefore, swarming, generally, must be later than usual; and those persons who are wishing to prevent it altogether must not be satisfied by simply placing boxes or glasses upon their stocks, but they must also see that the Bees take possession of them, and the best method to secure this is not to put the supers on until the Bees begin to be a little inconvenienced for want of room; and then, by placing a bit or two of guide-comb, as before directed, into the super, the Bees will enter it at once and commence working.

Queenless Stocks.—It is not at all unusual at this season to see the Bees of some hives, although possessing a good store of honey, quite inactive, carrying in no pollen, and basking in the sun at the mouth of the hive, but still giving smart resistance to a robber if he ventures to make an entry. This arises from the old age or death of the queen; and, if the Bees are numerous, will go on in the same manner nearly through the summer. But, if the numbers be few, robbers will attack them, and little or no resistance will be offered; but frequently the Bees themselves will assist in carrying off the store to the pirates' home, where the queenless Bees will meet with a ready welcome. The best method to adopt in such a case is to introduce a piece of comb from a strong hive, which contains both brood and eggs, and ultimately do very well. In Taylor's Bar Hive this process is very easily effected, by merely taking a bar of comb from one hive and introducing it into another, or a piece of comb, with eggs and brood, may be fixed in a bell-glass, and placed upon the queenless hive.

Queen Wasps.—To destroy these "Read's Syringe" is a very useful instrument, for by discharging it at them when they alight, it is sure to bring them to the ground, when the foot may easily be put upon them. It is important to every apiarian and gardener, but more especially the former, to destroy all they can at this season.

Early Breeding.—Many plans have been adopted to effect this very desirable object, and none entirely without success, but variously, according to the means used. The hives that have been simply bound with haybands are certainly earlier than those that have not; but those that have been covered with loose sacking, and then bound tightly round with oil-cloth, so that when the coverings were taken off for a few minutes the outside of the hive felt quite warm, are earlier still· whilst those

placed in a greenhouse are earlier than either; but the earliest are those covered with fermenting stable-litter; yes, literally placed in the centre of a hotbed, leaving only a passage for the ingress and egress of the Bees.

Proper Time for Taking Honey.—It is probable that in favourable situations, towards the close of the present month, some glasses, small hives, or boxes of honey may be in a sufficiently forward state to allow of their being taken off, which may be known by their being filled with honey, and the combs all sealed up; or they may remain till those placed beneath them are also sealed up. Upon very strong and populous hives, in a good season, it is necessary to place even a third; but this must be removed with great caution, and certainly not before the end of August, or the beginning of September, and not then unless the parent hive contains full 20 lbs. of honey.

## JULY.

Swarming is frequently much later than usual if May be wet and cold, and the stocks be very weak. It is very probable that second and third swarms will be coming in July, and should it prove so, we would recommend their being united to late swarms, or three or four of them being put together.

Returning Swarms.—The necessity for returning swarms in some seasons, I think, will be apparent to every one at all acquainted with Bee-management, and, indeed, in some cases of returning swarms; but this cannot be done with any chance of success but in a bar hive, and there the operator is sure to succeed. The manner of performing the operation will be as follows:—As soon as the swarm has left the parent hive, proceed immediately to open the hive and take out the bars, one by one, and cutting from each comb every royal cell that is seen upon it, and replacing the comb again in the hive. The cell in which the queen Bee is born is entirely of a different construction from that of either the drone or the common Bees. The cell of the latter is placed horizontally in the hive, and that of the queen is placed perpendicularly; that of the common Bee is an exact hexagon, and that of the queen circular; besides, the cell of the queen is always fixed at the sides of the combs, and generally upon that near the middle of the hive. This operation of removing the royal cells will take about five minutes; and, when done, return the swarm immediately to the hive. The old queen which led it off, finding by this process that there is no royal brood left in the hive to succeed her, will not again attempt to leave it. Persons who have never practised this method will be surprised to find how easily it is accomplished; for the parent hive will at this time be found to be almost depopulated from

the numbers that have left it in the swarm, and those that are out collecting. In some cases the help of a puff or two of tobacco-smoke may be useful, should the few Bees left be angry, or the operator feel at all timid. The readiest way of returning the swarm will be to lay a board upon the floor-board of the hive, and parallel with it, upon which, by a smart and sudden movement, shake the swarm, and as nigh to the entrance of the parent hive as can be done conveniently, and with the finger, or a piece of wood, guide a few Bees to the entrance, and the remainder will follow immediately.

Glasses and Small Hives.—The proper time for opening the communication between the boxes, as well as for putting glasses or small hives upon swarms that are in the Improved Cottage Hive, must in some measure depend upon the season. In a good season it may be done from the eighteenth to the twenty-first day after the time of their being hived. In some seasons I have had a glass holding 10 lbs. of honeycomb filled in less than a fortnight from the time of putting it on. When this happens, a box or small hive should be placed between it and the hive as directed at page 22; or, in all probability, a second swarm will be thrown off. To prevent this, every possible means must be taken; for the swarm coming so late in the season, as this must consequently be, is generally of no value, except to unite to others, and the stock itself is so weakened by it that it seldom lives through the following winter.

Melted Combs.—Shading should always be had recourse to in such weather as that of the middle of July, and more especially so for swarms of the year. In those cases where it has unfortunately taken place, it will be better to shade immediately and nothing more, leaving the rest that is to be done entirely to the Bees.

Shading.—Should the weather prove very hot and sultry, it will be necessary to shade newly-hived swarms for a few hours in a day, say from ten till two o'clock; a green bough answers very well for this purpose—that from the fir trees, perhaps, is the best, as well as the most durable. I have more than once seen the combs of a newly-hived swarm so heated by a July sun as to fall from the top of the hive, and the honey to run in a stream from its entrance, consequently the stocks were ruined.

Wasps.—I am quite sure that it is needful for us all to use every means in our power for the destruction of these sad enemies to our Bees. As "prevention is always better than cure," that object is attained by capturing the queen wasps at this time; and, indeed, as long as they can be seen. Some persons recommend shooting them. I have always found a garden-syringe to be a very useful thing; for if filled with water and discharged at them, it seldom fails to bring them to the

ground, but it matters not by what means so that they are destroyed.

## AUGUST.

I have already sufficiently insisted upon the necessity of uniting second and third swarms, so that, amongst my readers, not even one second or third swarm can be found by itself. It should be impressed upon the mind of every apiarian, "that the larger the colony at the outset, the better the Bees will work, and the more prosperous it will become." A stock weak at the outset *never* does well. The method of returning, as given at page 53, is very simple, and may be accomplished in a few minutes, even by the most inexperienced person.

Returning Swarms.—Returning first or second swarms to their parent hive, is not only attended with much trouble, and, generally, with a failure of the object desired, but also with much loss of time to the Bees, and that at a season of the year when every hour is of importance to them. A swarm left a Nutt's hive on the 3rd of June; the queen was captured, and the swarm returned. Within a few days of the time before mentioned it came out again, and was treated in a similar manner; and so it continued to go on until nearly the end of the month, when the swarm, instead of being returned to the parent hive, as had been done so many times before, was hived into an improved cottage hive, where it did very well; but during the whole time that swarming was going on, which occupied three weeks, and these the best three weeks of the year, working was entirely suspended (which is always the case), and not a pound of honey was stored; whereas, had the swarm been put in the cottage hive in the first instance, from 15 to 20 lbs. of honey would, in all probability, have been collected by it in that time. An apiarian, in Norfolk, some years since, had a stock of Bees in a favourite hive, which, very much against his wishes, and notwithstanding every means having been taken to prevent it, sent out a swarm. He captured the queen, and returned the swarm; after a few days the swarm came forth again, and was treated in the same manner, and it went on to swarm for either seven or nine times, and was returned as many times, except the last, when it was put into a new hive. Thirteen queens were captured and destroyed during this process, very nearly a month was spent in swarming and being returned, and, consequently, no work was done during that time; the result of which was that the best part of the season having been lost neither swarm nor stock was of any value. I would, therefore, say, Let all be done that can be done to prevent swarming, by giving room and ventilation, which has very rarely failed; but if, after every means has been used to prevent swarming, a swarm should come

off, never attempt returning it, but hive it by itself in the usual manner.

Early Swarms.—Now, as early swarms appear to beso very desirable, it may be asked, What are the most likely means of insuring them? And, in reply to this question, I would say, Leave the stocks rich in store in the autumn, the contents of each hive weighing, at least, from 20 to 25 lbs., and let the population also of each hive be very numerous; if it be not so, add the Bees from weak hives into it.

Autumnal Unions.—Where second and third swarms have been hived by themselves, they will generally be found too poor to live through the winter, even with feeding; and, where this has been done, they may be put two or three together in the manner directed at page 60.

Taking Honey.—Those persons who have been so fortunate as to get their glasses filled with honey will now be preparing to take them off; but I would recommend every one to do it with great caution; and not only first to weigh the matter well in their own minds, but also to weigh their *hives*, and if it can be satisfactorily proved that they will contain 20 lbs. of honey each when the glasses are removed, all well; but if not, let the glass or box remain upon the stock hive until the bees have emptied it of its honey; as soon as this is ascertained, let it be removed.

Some persons having found much difficulty in expelling the Bees from a glass or box, after having removed it from the stock hive, and others who have complained of the time occupied in effecting this object, may adopt the following very ingenious and useful apparatus, invented by Mr. Antram, a clergyman of Devonshire, and which has been kindly handed to me, with his permission to make it public. It is a contrivance for emptying a hive of its occupants; it may also be applied to a bell-glass, or box, either at top or attached to a board on which the removed glass is placed. He calls it his

Bee-trap; and it is, he says, "An invention for taking the honey from every description of double hive, which is not only simple, but very efficacious, and entertaining to watch. I should premise that every extra box or hive must be furnished with a second aperture *never* to be opened except when the honey is to be taken. Provide a block of wood 1 inch longer and half an inch deeper than the aperture, and 3 or 4 inches wide; cut the front to an angle of 45° or less; then cut out of the under part a groove the exact size of the aperture, thus leaving a thickness of half an inch of wood at the sides and top. Get a piece of talc, or very thin horn (glass is too heavy), cement or gum it to a piece of ribbon, which latter fasten to what remains of the sloping front above; divide the talc into portions about a quarter of an inch wide. A tin bottom should be affixed

to the whole, to which the talc must reach, and on which it must rest.

"When you wish to empty a hive place this before the opening before mentioned, and cut off the communication between the hives; the Bees, seeing the light, will one by one push up the small pieces of talc and escape; the talc falls back in its place; thus there is no re-entering, and your hive becomes rapidly emptied. There is here no previous removing of the hive or box, no danger of a sting, and no fear of robbers; even if the queen be there, she, finding herself deserted by her subjects, will soon depart, and re-enter the stock hive by the accustomed entrance. It acts upon the same principle as the old wire rat-trap. Two loops of tin, with holes through, are added, to fasten or suspend it, when there is no alighting-board. It may be placed on the top of a box, but must then have a hole in the bottom, and a slip of tin by way of a back; the tin bottom may project a little beyond the lower edge of the talc in front, and, indeed, it is better so."

This useful contrivance I feel assured will be adopted by many persons; for it will entirely prevent the tediousness of watching a glass of honey until the Bees have left it, which without this protection is at all times necessary, and more especially so when taken late in the season, and robbers are on every side. I have more than once seen a good glass of honey emptied of every drop by them when carelessly left by its owner for a few hours; now, with this trap attached, it may be left even for days with perfect safety.

Taking off Glasses of Honey.—Some persons, I doubt not, are beginning to be anxious to possess themselves of a few glasses of honey from their Bees. If the combs are sealed up they may be taken; but I would recommend every one who attempts it during hot weather to be more than commonly careful how they remove them, or the combs will fall out.

Knife for Cutting out Combs.—This knife, which is so simple in its construction, and so easily used, deserves to be made generally known. Gelieu, to whom apiarians are much indebted, tells us that in Switzerland it is commonly used, and that the combs, from hives of any shape or materials, are extracted without any difficulty. It is formed of a strip of steel

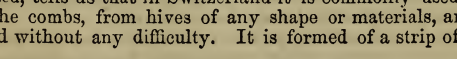


Fig. 26.

2 feet long by one-eighth of an inch thick; the handle is 20 inches long by half an inch broad. The turn-down blade, of 2 inches in length, is spear-pointed, sharp on the edges, and bent so as to form an angle of 90° with the handle; the other blade is

2 inches long by 1¼ inch broad, and sharpened all round. The broad blade cuts and separates the combs from the sides of the hives; and the spear point, which is also sharp on each side, admits, from its direction and narrowness, of being introduced between the combs to loosen them from the top of the hive.

ENTRANCES TO HIVES TO BE NARROWED.—Towards the end of this month it will be necessary to contract the entrances of the hives, that the Bees may be better enabled to defend themselves from the attacks of wasps. In Taylor's Hive, these things are supplied; but, in the Cottage Hive, I have found wedges of cork of different sizes to answer remarkably well.

WASPS' NESTS TO BE DESTROYED.—It will be well to have diligent search made in the neighbourhood of the apiary for wasps' nests, and to have them destroyed, for which purpose the spirit of turpentine appears to answer remarkably well. The usual method of procedure, I believe, is to put a small quantity into a common wine bottle, to put the mouth of the bottle into the hole leading to the nest, and surrounding it with earth. Very little turpentine is required—merely as much as will wet the sides of the bottle. If applied in the evening every wasp will be dead the following morning. In no instance have I known it to fail of the desired effect, except in cases where the nest is deep in the ground, or at a greater distance from the mouth of the hole than was anticipated. A failure may sometimes occur when there happen to be two entrances to the nest instead of one; but a second application on the following evening is sure to prove effectual.

ADDITIONAL ROOM.—It will be quite useless to give additional room to any colony of Bees, be they ever so prosperous, after the month of July is ended; for the honey season is fast drawing to a close, and the population of the hives very much upon the decrease, not only from the killing of the drones, but by the death of numbers of the workers.

TRANSPORTING HIVES.—In a fine season, and in the prospect of a fine autumn, every person whose locality admits of it should embrace the opportunity of sending his hives to the moors. The advantages must be incalculable, not only in quantity, but in the delicious quality of the honey there obtained.

SHADING.—Should the present month prove hot it will be well to screen the swarms of the present year from the intense heat of the sun, or the combs, being new and tender, may be melted by it; where this unfortunately happens the stock is usually destroyed.

ROBBERS.—Late swarms and stocks that are weak must be closely watched, and if the least appearance of robbing discovers itself, the entrance to the hive must be closed so as to admit but one Bee at a time.

DRESSING HIVES.—It would be well if this practice was dis-

continued altogether; for when done in the most judicious manner the Bees are greatly annoyed by it. A clean dry hive is more pleasing to them than one besmeared with ale, honey, fennel, and all the other good things used by good dames of old. I heard of one having been washed, or smeared, with cream and sugar, and in so profuse a manner that the Bees, which had to travel an hour by rail, were found at the end of their journey to be completely saturated with it, a large portion of them dead, and the remainder in such a state as to render it necessary to kill them the next day, to the vexation and disappointment of the gentleman to whom they were sent, who had been impatiently waiting their arrival for some weeks. Cream I should imagine to be the most disagreeable thing that could be thought of for this purpose, except it should be oil, which is well known to kill a Bee, or almost any insect, the instant it touches it, and this cream I believe was some of the far-famed Devonshire, which in its rich and buttery nature approaches very closely indeed to oil.

## SEPTEMBER.

Removing Supers.—It is now quite time to remove glasses and supers of every kind from hives intended for stocks, and to see that each one contains at least 20 lbs. of honey; if not, they had better at once be made up to that weight by feeding. At this time of year I would recommend syrup in preference to barley-sugar, because it can be given in larger quantities, and stored more quickly. Honey is, unquestionably, the best food that can be given; and, next to it, a compound of honey, loaf sugar, and water. Barley-sugar is more suited to spring feeding, when but little is required. The proportions are, one pound of sugar, one-quarter of a pint of water, and one-quarter of a pound of honey, mixed and simmered over a slow fire till the sugar is melted.

Early Breeding.—In our fitful climate this is a most important thing to effect, and every possible means for promoting it should be used; therefore in addition to what I have already said in the calendar for last month—viz., leaving the stocks rich in store, as well as in Bees, I would now say, Keep the stocks as cool as possible till the end of February; and if, as has already been said, that cold retards the hatching of the brood, warmth may be supposed to promote it. I would therefore recommend, where it is at all practicable, at the end of February to increase the temperature of the hives, by defending them externally from the cold of March and April, by any means that may the most readily be had recourse to for the purpose. Perhaps binding the hives neatly over with haybands would be as little trouble and inexpensive as anything.

Shading.—It is very desirable to shade the hives from the

winter's sun, for the Bees are not unfrequently tempted thereby to leave their hives, never to return.

Stocks for Next Season.—The time will soon arrive for setting apart stocks to stand through the winter. Each one intended for this purpose should be made to weigh from 20 to 25 lbs., and the Bees of all weak or very old stocks, the hives of which are decaying so as not to stand with safety through another season, should be driven to those that are the least populous in the apiary; for it must be remembered, that not only a good store of provision, but that a large quantity of Bees, also, is necessary to secure success for another year.

Driving.—For performing this operation, as well as for almost all others, I very much prefer the middle of a bright day to any other time. The process is very simple, and may be effected in a few minutes. I very much wish that I could persuade all my cottage friends to adopt it, instead of the cruel and wasteful method of "burning;" for in weak stocks the Bees themselves are frequently of as much value as their little store of honey and wax; and, by joining them to other stocks, very considerable advantages arise. My method of driving is this:—On a bright day, between eleven and one o'clock, turn the hive from which the Bees are to be driven bottom upwards, in a shaded corner of the garden, and place upon it a hive of the same size; see that they fit closely, and to make the junction more complete, tie a cloth round the hives where they meet. Then, with two sticks, keep up a gentle but continuous tapping upon the sides of the inverted hive for about ten minutes, the Bees will by that time have left it and gone into the upper one. Having ascertained that fact, take it immediately to the place where the driven hive was taken from, and place it upon the same floor-board; carry the driven hive 50 or 60 yards away, and place it upon a fresh floor-board; the few Bees that remain in it, as well as those that are out at work, will return to the driven Bees. All is now finished until an hour after sunset, except emptying the driven hive of its store, when two sticks may be laid upon the ground about 8 inches apart, opposite the stock to which the driven Bees are to be joined; then, with a smart stroke dash out the Bees between the sticks, and instantly, but very gently, place the stock they are intended to enter upon the sticks; leave them for the night, having first defended them from rain, should any fall; and in the morning, an hour before sunrise, replace the stock in its original position, and all will be peace and harmony. Here, then, will be an increased population—a stock thereby enabled to stand through the winter much better, and to send out a much earlier swarm, if swarms are desired, than if the union had not being effected.

Wasps.—It will be well to destroy wasps' nests in those localities where they are to be found.

STANDS.—The end of the month will be a good time to examine the pedestals upon which the stocks are placed; for it is not unusual to hear of a stock being destroyed by the pedestal decaying just below the surface of the earth, so that by a strong wind, or anything accidentally going against it, it is broken, and the combs by the fall so misplaced as to render the stock of little or no value.

PRESERVING HIVES OF COMB.—Where the Bees have deserted their hives, and it is swarms of the present year that have generally done so, the combs should be carefully preserved, by placing the hives in some dry spot out of the reach of mice or insects, for the purpose of hiving swarms into them in the spring. The advantages afforded to a swarm by putting it into a hive of fresh, clean comb, are scarcely to be credited by those who have not experienced it.

## OCTOBER.

The time has now arrived for deciding upon which stocks are to be set apart for standing through the winter, and which are to be driven and joined to other stocks in the manner given in the calendar for last month. Those set apart either for swarming or working in glasses next year, should be rich both in Bees and honey, weighing, at least, from 20 to 25 lbs. each. Those that are not so heavy must have a few pounds of food given to them immediately, as well as having the Bees from weak stocks joined to them.

In giving the estimated weight which should be allowed for the comb and Bees in hives of the first year, and when two, three, four, or five years old, I would say, for a hive of seven years standing, during the autumn and winter months, allow for combs, Bees, and stored pollen, 7 lbs.; for one of six years, 6½ lbs.; for five years, 5½ lbs.; for four years, 4½ lbs.; for three years, 3½ lbs.; for two years, 3 lbs.; and for one year, 2 lbs.

Presuming the directions given in the calendar for September, as to unions and feeding, have been attended to, but little attention will be required this month beyond guarding against depredations of wasps, which are frequently numerous at this season.

WINTER PREPARATIONS.—Glasses, small hives, and boxes, should now all be removed from stock hives, where it can be done without reducing the store below 20 lbs. The stands, likewise, where wood is used, should be examined, and if found to be at all unsound replaced with new ones.

THE MOORS.—Where Bees are kept in the vicinity of the moors, or where they have been removed to them, an abundant supply of honey will be obtained from the heather during fine weather, an advantage quite unknown to the Bee-keepers of the eastern counties.

Wasps.—For destroying wasps' nests, gas tar is even better than turpentine, and their destruction is effected with much less trouble, it being only necessary to put a small quantity into the mouth of the nest, and cover it with earth; digging out the nest, or anything further done, is quite unnecessary.

Robbers will at this time be carrying on their depredations; and should a serious attack be observed, the entrance must be narrowed one-half at the least. Wedges of cork answer very well for this purpose.

Stocks.—It is now full time for the stocks to be put in order for the approaching winter. Defending them effectually from wet is of the first importance. Narrowing the entrances to prevent the ingress of mice is also necessary, as well as their destruction in the neighbourhood of the apiary. Having done this, and taken effectual means for keeping the hive free from damp, very little fear need be entertained of their being carried safely through the winter without any further attention beyond that of occasionally cleaning the floor-boards, and shutting up the hive whilst snow lies upon the ground.

Coverings.—The coverings, also, to the hives should be made secure against winds and rains. A milk-pan, notwithstanding its unsightly appearance, is the best protection for a hive, and for the winter months more especially so.

Stands.—Let the pedestals which support the hive be well looked to at this time. Although to the eye they may appear sound, let them be examined 2 or 3 inches below the surface of the ground, and should they be found in an unsound state replace them by new ones: and if they are little charred before fixing, it may be the means of preserving them a little longer.

Bees with a North Aspect.—Much has been said of late as to the advantages arising from placing Bees with the hive's entrance to the north, which the following letter from a gentleman in Devonshire tends very much to strengthen. He says:—

"In compliance with your wish, I visited B—— yesterday, and, although not fortunate enough to find Mr. D. at home, I had a long conversation with his gardener, who alone appears to take any interest in the apiarian matters. One wooden hive, brought by Mr. D. from Oxford, is placed behind a wall, through which the Bees issue towards the south; another wooden hive is completely embedded in shrubs, but the entrance faces the north, There is a stock in a portion of a hollow tree, which was found when the tree was cut down, and removed to its present position, also facing the north, and a row of fifteen common straw hives have the same aspect: thus you will perceive that seventeen out of a total of eighteen stock are kept permanently facing the north. The gardener states that he has preferred a north aspect during the last ten years, and that he gets earlier swarms and more honey than his neighbours. For two or three years pre-

viously he kept half his Bees to the south, and half facing the north, and by weighing them in the autumn and spring (September and April), invariably found that those facing the south consumed ten times the quantity of food as compared with the others—for instance, if one consumed 10 lbs., the other consumed but 1 lb.; and if one lost 15 lbs. during the winter, the other would only diminish 1½ lb.

"I should state that B—— appears to me a first-rate locality, being close to an extensive heath, now in full flower. The gardener told me that not only had he no difficulty in maintaining second swarms, or casts, during the winter, but that he considered them quite equal to the first or prime swarms. The row of straw hives is sheltered by trees and shrubs towards the south, but lies exposed to the north wind, which the gardener considers most important, as he attributes the diminished consumption in the winter to the cold winds keeping the Bees torpid. The above is all the information I was able to glean during a long conversation, as no kind of memorandum of any of the experiments has been kept, and in the hope that it may prove interesting, I am, &c."

Now, it must be remembered that this has been done in Devonshire, and it is not unlikely that climate may have to be considered as to aspect, and what may do in Devonshire might not answer so well in colder parts. It has frequently been recommended to give Bees an aspect more or less southerly in summer, and a northerly one in winter; but there seems now to be the strongest reason to expect that for all seasons the north will be found most suitable.

## NOVEMBER.

The requirements of the apiary are but few during the present month, provided that feeding has been well attended to in the last. Should it, however, have been neglected, no time must be lost in setting about it before cold weather sets in, which may now reasonably be expected.

Feeding.—By this time hornets and wasps will have finished their work of destruction and pillage; each hive, therefore, must now be carefully examined and weighed, and should any be found having less than 18 or 20 lbs. of honey, supply them immediately with a sufficient quantity to bring them up to that weight.

Floor-board.—Clean the floor-board of each hive by scraping it with a knife, and brushing it afterwards with a dry brush, and see that each hive stands firmly on its pedestal, and is well defended against wet; and for effecting this (especially during winter), I have never yet found anything equal to the milk-pan, heavy and unsightly as it unquestionably is. I have seen covers

of zinc used, but they are too light and frequently blown off by the wind; and one night's heavy rain at this time of year will very nearly, if not quite, destroy one of the best stocks. A gentleman of my acquaintance has had covers of cork made at a cost of 30*s.* each, and very elegant things they are; but, after about fourteen months' trial, they are abandoned because they will not effectually keep out wet.

ENTRANCES.—The entrance to the hives must now be narrowed so that only two or three Bees can come out at the same time; for at this season mice are very likely to lodge themselves in the hives, and they are very hurtful and destructive to the Bees; for, having once fairly lodged themselves in a hive, its entire destruction will be effected by them in a few days. Mr. Huish relates an anecdote of having found a dead mouse in one of his hives. He says, "In the month of December, on inspecting my apiary, I perceived a hive to be in an unusual bustle and the Bees in great agitation. I was convinced that some accident had occurred in the interior of the hive, and I resolved to examine it. To my great surprise I found a dead mouse on the stand, and it was almost covered with propolis (Bee-bread). I first resolved to remove this nauseous object; but, on more mature reflection, I was not willing to forego the opportunity of experiencing, by actual observation, one of the most profound acts of foresight and wisdom which can possibly be found in the works of the animal creation. What power is that which taught the Bee the necessity of covering the dead mouse with a plaster? It might have been thought sufficient to kill it, that their property might be saved, and then leave it to waste away in the common process of putrefaction. But were this process to be allowed to take place, the health and safety of the whole hive would be endangered. To prevent, therefore, this occurrence, the body of the mouse is, as it were, embalmed in a case of propolis, and the object rots away without emitting any offensive odour." I have myself occasionally found a snail fastened to the floor-board in a similar manner. But a greater enemy to Bees during the winter months than even the mouse will be found in that little marauder the blue titmouse (*Parus major* of Linnæus), which may be said to stand foremost as their enemy. Mr. Purchase says, "She will eat ten or twelve Bees at a time, and by-and-by, be ready for more. When she comes to the hive and finds none, she knocks with her bill at the door, and as soon as the Bees come out to inquire the cause, she catcheth, first one and then another until her belly be full." This I have observed in an apiary of about twenty hives, in a village nigh to me, for the last two winters; the entrances of the hives by the end of the winter having the appearance of being gnawn by rats, which has all been done by these birds. Shoot and trap them in the winter, and destroy their nests in breeding time.

Removing Supers.—All super as well as nadir hives should now be removed, reducing the room occupied by each stock as much as possible.

Ventilation.—In hives of wood I have always found it necessary during the winter months to withdraw one of the slides at the top of the hive, and place over the opening a feeder or small glass for the purpose of carrying off the condensed vapour, which would otherwise run down the sides of the hive, and cause dampness and mouldiness to the combs, and sometimes the entire destruction of the stock. Mr. Taylor gives a drawing of a condenser for this purpose in his "Bee-Keeper's Manual," page 142, fourth edition, which I have found to be very useful where a feeding-pan could not be placed.

Removing Bees.—Should any of our readers, from what has already been said, feel disposed to try a northern aspect for their Bees, I would recommend their not being removed at this time, except they are brought from a distance, and when it is immaterial at what time they are removed; but if it be only from one part of the same garden to another, it will, be it when it may, be attended with considerable loss; therefore it had better be done when the cells are filled with brood—perhaps towards the end of March.

Advantages of a Northern Aspect.—I still continue to receive very favourable reports from those persons who have tried a northern aspect for their hives. The results in every case already represented to me have been satisfactory; but I am persuaded that the greatest care must be taken to keep the whole exterior of the hives from wet, where they are not placed in a Bee-house; and however averse I may hitherto have expressed myself to the use of Bee-houses, I am now inclined to think that where a northern aspect is decided upon they may be necessary. In Devonshire it may not be required; but wherever hives are placed in this aspect without the protection of a house, I would particularly recommend that, be the coverings whatever they may, they be sufficiently large to prevent the drip from falling upon the floor-boards of the hives; for this would engender dampness, and the loss of the stock would, in all probability, be the consequence.

Bee-Houses.—It must be remembered that, wherever they are adopted, they require the greatest care as to neatness and cleanliness, for at best they are hiding places for the Bees' worst enemies.

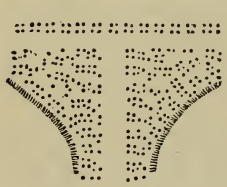
## DECEMBER.

Those persons who have been so fortunate in this untoward season as to obtain a few glasses of honey from their Bees' must now look well to their stocks, and by judicious feeding,

get them up to 20 lbs. at least, if it has not been already done. I would very strongly recommend the food being supplied at the top of the hive; and should the Bees be in a hive that has not a hole in the top, with a sharp knife make one forthwith, for the danger as well as the inconvenience of feeding at the bottom, and more especially at this season, is very great.

Food.—I believe the best food that can be given, next to honey, which in some years is far too expensive for feeding, is one pound of loaf sugar, one quarter of a pint of water, and one quarter of a pound of honey, simmered for a few minutes over a slow fire till the sugar is melted, and when quite cold, given to the Bees, and at the top of the hive if possible.

Stocks will require but little attention during this month beyond cleaning the floor-boards, and seeing that there is neither damp nor mould in the hives; and if the floor-boards are observed to be quite dry, it will be a pretty sure indication that all is right within. Stopping-up, however, must not be forgotten when snow lies upon the ground, if the Bees are so placed that the sun shines upon their hives. Shading during the winter months is practised by many persons, and is a very good plan; but when we come to have all our Bees placed in the north, it will be rendered unnecessary. An intelligent cottager brought me a very ingeniously-contrived little apparatus for preventing the sun's rays in winter inducing the Bees to come out, and at the same time preventing the cold winds from blowing into the hives. It is a piece of three-quarter-inch deal, 3 inches wide, and 2½ long, reduced at one end (not in thickness) so as to fit in the mouth of the hive, and then with a gouge the under side is hollowed-out for about 2 inches in length, and five-eighths of an inch in breadth, in a straight line with the entrance of the hive; another hollow of the same dimensions is then made, intersecting at right angles the one already made, so that if the hive faces the south, the Bees come out east and west. The under side has this appearance. Care, however, must be taken that this little contrivance is not pushed into the hive beyond the thickness of the straw; and it must also be remembered that it will require to be taken out occasionally, to brush away the dead Bees that may accumulate inside, or the passage may become blocked up, and the health of the stock endangered.



The population of the hives will now be found to be very much reduced; but alarm for their safety on that account need not to be entertained. It has been frequently said to me, "What becomes of the Bees managed on the depriving systems

if they are never suffered to swarm nor are destroyed?" To which my reply has been, That it is well known to those who are conversant with the care of Bees, that their numbers decrease greatly in autumn, not only by the destruction of the drones, but also by the unavoidable deaths of many of the workers, owing to the thousand accidents they meet with in the fields, and owing to age. A much less space, therefore, is required for them in the winter than was necessary in the summer months. Mr. Purchase, who was a very careful observer, says, in his Treatise on Bees, published in 1657, "It is manifest that the Honey-Bees are but yearly creatures; they live but a year and a quarter at most; for those Bees that are seen in May, lusty, full, brown, smooth, and well-winged, will, by the end of July following, begin to wither, becomes less, look grey, and have their wings tattered and torn, and be all dead before the end of August"

Ventilation.—It will be advisable, where Bees are in boxes, to see that they are well ventilated. If in Mr. Taylor's Amateur's Bar Hive, I would recommend the feeding-pan being allowed to remain on during the winter—say till the end of March—and one of the zinc sides of the hive taken out; and if in any other kind of box, let a bell-glass be placed over the opening at the top, on the inside of which the vapour of the hive will condense, and so pass off. "Perhaps," says Mr. Taylor, "there is nothing more prejudicial than the moisture often engendered in hives at this time, particularly after frost, and in certain states of the atmosphere. It accumulates on the top and sides, moulding and rendering offensive the combs, and producing disease amongst the Bees. For this reason, hives with flat roofs have sometimes been objected to, and perhaps, justly, when no provision is made for ventilation." Gelieu obviated the evil by placing caps or small hives over the stocks, the moisture ascending evaporated through the opening. "I have," says Mr. Taylor, "tried different expedients, and have found nothing better than the practice of condensing the vapour of the hive as much as possible, and conveying it away." (See "Taylor's Bee-Keeper's Manual," page 149, fourth edition, where a figure of a condenser is given). I would strongly recommend that particular attention be given to this little matter by those whose Bees are in boxes; for want of it many excellent stocks are lost, or become so depopulated as scarcely ever to recover.

I have never yet found that hives made entirely of straw require any ventilation whatever; indeed, I consider it better for them to have none; while those of wood or glass are in great danger of being destroyed without them, for in very cold weather the vapour of the hive condenses on the top and sides, and runs down upon the floor-board in such quantities as to cause general dampness and mouldiness upon all the combs,

When in this state, if timely assistance be not rendered, ruin very soon follows.

Where Bees are in boxes, ventilation is of the next importance to feeding. I have found the best method to secure a perfect ventilation is to leave one of the gratings, or holes at the top of the box, open, from this time till the end of February, and placing over it a small bell-glass, or feeder; the vapour will then condense upon the former, and run down outside the box, or upon the glass of the latter, and be caught in the pan.

Enemies.—Mice and birds must be carefully looked after, for they are both very busy at this time, and will destroy a stock. sometimes very quickly, if allowed to pursue their depredations unmolested.

Hives.—This is a good time to get a supply of straw hives in readiness for the coming season, and to have them well covered with three coats of paint—stone or straw colour is the best; white, when the sun shines upon it, is too dazzling, and any dark colour absorbs too much heat.

Snow.—Whilst snow lies upon the ground, *but not an hour longer*, the entrance of the hives should be stopped with perforated zinc, and not a single Bee allowed to leave them

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